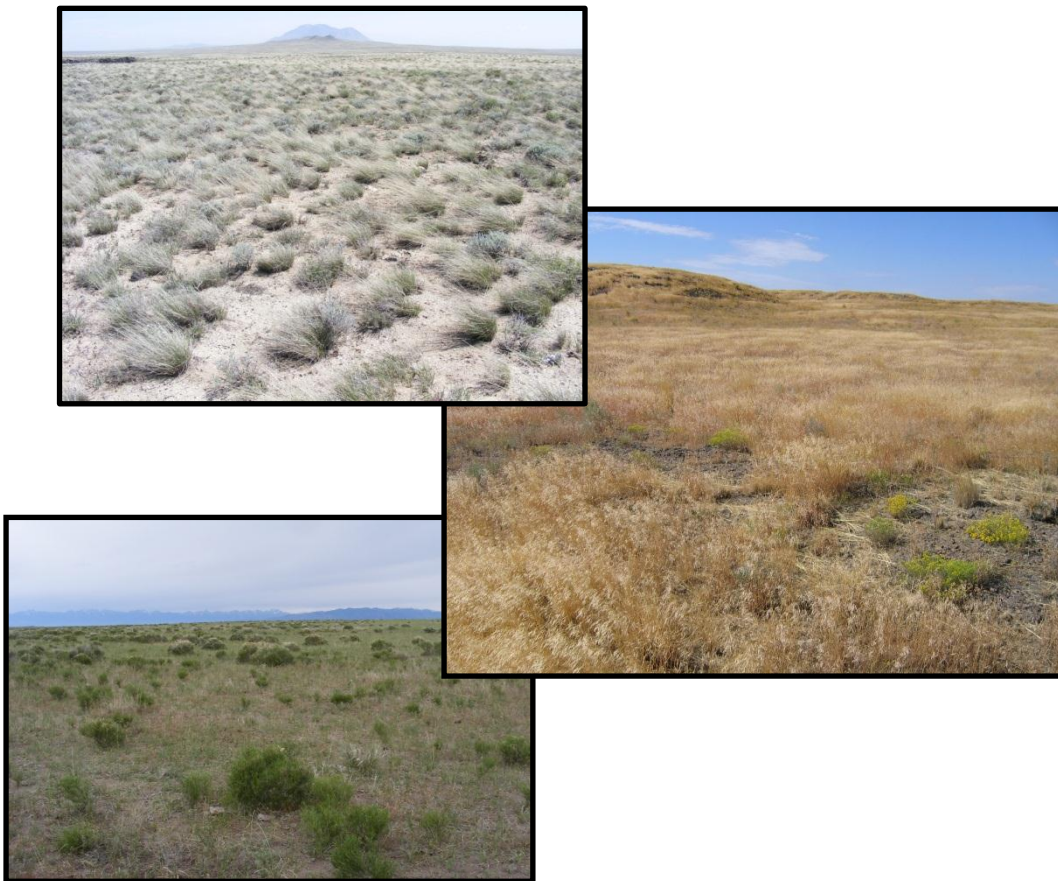


**United States Department of the Interior
Bureau of Land Management
Idaho Falls District
Upper Snake Field Office**

**Environmental Assessment of the
Upper Snake Sagebrush Steppe Restoration Project
EA# DOI-BLM-ID-I010-2015-0012-EA**



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CHAPTER 1 – INTRODUCTION

The Bureau of Land Management (BLM) Upper Snake Field Office (USFO) is preparing this Environmental Assessment (EA) to analyze a proposal to restore and/or improve approximately 70,320 acres of sagebrush steppe by implementing extensive herbaceous seedings and hand planting treatments within the public lands administered by the BLM's USFO (Appendix A, Map 1). This EA discloses the direct, indirect, and cumulative environmental effects that would result from implementation of the proposal as required by the National Environmental Policy Act (NEPA) of 1969. The EA provides a site-specific analysis of potential effects that could result from implementation of the alternatives and assists the BLM in making a determination as to whether any significant impacts could result from the analyzed actions (40 CFR 1508.27). The EA will provide evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) that presents the reasons why implementation of the Proposed Action or action alternatives would not result in "significant" environmental effects. Preparation of the document has been in accordance with the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] § 1500 et. seq.), BLM guidelines for land use planning in BLM Handbook H-1601-1, BLM guidelines for implementing NEPA in BLM Handbook H-1790-1, and the Idaho Falls District Guide for Implementing NEPA (IM-ID-300-09-004).

Background

The BLM-administered public lands within the Sagebrush Restoration project area were historically a mosaic of shrub and herbaceous dominated vegetation. The historical native vegetation was comprised of a sagebrush-dominated plant community; inter-mountain basins big sagebrush steppe. Sites historically consisted of perennial grasses and forbs (>25% cover) with Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) and basin big sagebrush (*Artemisia tridentata tridentata*) dominating or codominating the shrub layer. Historically, shrub layers were open to moderately dense with a cover ranging between 10-40%. The disturbance regime for this vegetation community mainly focused around fire, however, drought, climate shifts and insects and disease outbreaks did play a lesser role and depending upon the severity could have led to the replacement of the stand. Fires within the sagebrush steppe mainly consisted of stand-replacement fires with an estimated fire return interval (FRI) of between 35–100+ years (Landfire, 2007).

Fire records dating back to the early 1940's, show that wildfire activity within those BLM lands that make up the various treatment units has been irregular, with some areas experiencing

excessive fire and others too little. More recently (within the last 20 yrs), 20 wildfires have consumed a total of 60,920 acres or 87% of the native vegetation within the 11 treatment areas. These fires removed a majority of the mid to late seral sagebrush steppe vegetation that once dominated the sites. As a result, much of the area that was once categorized as Key Greater sage-grouse habitat has now been classified as Restoration I (R1) perennial grasslands and even in some cases Restoration II (R2) annual grasslands. In many of the areas that have previously burned Emergency Stabilization and Rehabilitation (ESR) treatments were implemented, with varying degrees of success, to aid in the post-fire recovery of the site. To date approximately 55,835 acres or 79% of the treatment areas have been reseeded via the ESR program. Additionally, several of the treatment areas were treated via range improvement projects that focused on improving degraded range condition and fuels reduction projects that focused on improved the ecological condition of the sites by reseeding native vegetation and reducing annual grasses. Approximately 17,090 acres or 24% of the treatment areas have been seeded with either native or non-native grasses through these two treatment programs.

Wildfire, within its historic range of variability, is a natural process and is required for nutrient cycling and maintenance of a healthy ecosystem. However, due to alterations to the historic FRI it has become one of the principle disturbances altering landscape characteristics in the Upper Snake River Plain sagebrush steppe. Historically, fires within the Wyoming and basin big sagebrush vegetation types of the Snake River Plain occurred at a mean FRI of 75-94 years with an average patch size of approximately 250 acres (Landfire, 2007). Alterations to the historic fire ecology of the area due to the introduction of non-native invasive species, such as cheatgrass, have resulted in larger fires occurring at shorter return intervals. When the interval becomes too short, native shrub and perennial bunchgrasses cannot recover and energy reserves become depleted resulting in an area dominated by invasive annual grasses. Conversely, when intervals become too long, native shrubs become overly dense and decadent and reduce the health and productivity of the native herbaceous understory. Vegetation management can counter these effects by implementing restoration and rehabilitation treatments in areas that have been experiencing disturbances outside the vegetation's natural range of historic variability.

A Fire Regime Condition Class (FRCC) assessment for the existing vegetation and disturbance regimes within the project area was calculated to be an FRCC II (Appendix B, FRCC Methodology and Analysis). Landscapes classified as an FRCC II are defined as having moderately altered fire regimes and are moderately at risk of losing key ecosystem components. Additionally, fire frequencies may have departed by one or more return intervals (either increased or decreased), resulting in moderate changes in fire and vegetation attributes. If left unchecked, this continued modification of the fire and vegetation attributes as a result of the unyielding propagation of cheatgrass, threatens to further reduce the quality and quantity of the

existing Greater sage-grouse (*Centrocercus urophasianus*) and other sagebrush obligate species habitat. Greater sage-grouse are now listed as a candidate species by the US Fish and Wildlife Service (FWS) whereby the FWS have determined that listing is warranted but has been precluded. Fire and invasion by exotic annual grasses are widespread causes for habitat loss, particularly in the western part of the sage-grouse range (Miller et al. 2011). These two significant threats to Greater sage-grouse and their habitat warrant treatments to maintain or improve the habitat throughout the species range. Treatments, such as the chemical control of annual grasses, seeding of native/non-native grasses and the planting of sagebrush seedlings can reduce competition, increase nutrient availability and increase native vegetation. The final outcome is a sagebrush steppe containing multiple successional stages of more diverse vegetative communities.

Purpose and Need for Action

The purpose of the Sagebrush Steppe Restoration project is to improve habitat conditions for special status wildlife species, migratory bird species, and big game, as well as restore and improve native sagebrush steppe vegetation in areas where native plant communities have become degraded. The proposed project is needed because wildfires and other past disturbances have led to a decline or loss of native forb, grass and shrub species within the USFO.

Management actions are needed to provide quality habitat for sagebrush obligates such as Greater sage-grouse and to, over time, allow for the widespread recovery through natural regeneration of the Upper Snake River Plain Sagebrush Steppe. The purpose of the Proposed Action and action alternatives would be to:

- Protect and promote healthy sagebrush steppe ecosystems by reducing the density of annual grasses and aid in the reestablishment of native grasses, forbs and shrubs.
- Improve the health, vigor, and acreage of the native sagebrush steppe vegetation.
- Improve wildlife habitat by providing multiple successional stages of more diverse vegetative communities.

Location of the Proposed Action

The Upper Snake Sagebrush Steppe Restoration project is made up of an assemblage of treatment areas located throughout the Upper Snake River Plain within the counties of Bingham, Bonneville, Butte, Clark, Jefferson and Power (Appendix A, Map 1). The 70,320 acre project area is comprised entirely of BLM-administered public lands, with treatment areas residing within three main management areas: Big Desert, Twin Buttes and Table Butte. The project area consists of 11 disconnected treatment units that range in size from 180 to 25,440 acres. A

complete list of the legal descriptions for each of the 11 treatment units are identified below (Table 1).

Table 1: The Proposed Sagebrush Steppe Treatment Units.

<i>Treatment Unit</i>	<i>Legal Descriptions*</i>	<i>Acres</i>
Camas Butte	T. 08 N., R. 35 E. Sec. 1 & 2 T. 08 N., R. 36 E. Sec. 5 & 6	1,197
Deadman Native	T. 02 N., R. 27 E. Sec. 1 T. 03 N., R. 27 E. Sec. 24, 25 & 36	848
Fred Butte	T. 04 S., R. 29 E. Sec. 22-29 & 32-35	5,560
Hells Half Acre	T. 02 N., R. 36 E. Sec. 26 & 27	182
Jefferson	T. 04 N., R. 34 E. Sec. 1-3, 10-12, 14 & 15 T. 05 N., R. 34 E. Sec. 10-15, 22-27 & 34-36 T. 04 N., R. 35 E. Sec. 6 & 7 T. 05 N., R. 35 E. Sec. 7, 8, 17-20 & 28-32	15,427
Mesa	T. 08 N., R. 35 E. Sec. 6-8, 17-21, 27, 28, 33 & 34 T. 07 N., R. 35 E. Sec. 2-4, 10, 11, 13 & 14	4,460
Stage Road	T. 02 S., R. 31 E. Sec. 12-15, 21-28 & 33-35 T. 02 S., R. 32 E. Sec. 7-9, 17-23, 25-31 & 34-35 T. 03 S., R. 31 E. Sec. 1-4, 9-15 & 22-27 T. 03 S., R. 32 E. Sec. 6	25,439
Table Butte	T. 09 N., R. 35 E. Sec. 14, 15, 20-23, 26-29 & 32-34 T. 08 N., R. 35 E. Sec. 5 & 8	5,750
Table Legs Butte	T. 01 N., R. 31 E. Sec. 25 & 26 T. 01 N., R. 32 E. Sec. 28-33 T. 01 S., R. 32 E. Sec. 3-6 & 8-10	5,601
Twin Buttes	T. 01 N., R. 31 E. Sec. 1 & 12 T. 01 N., R. 32 E. Sec. 1-8, 10-12 & 18	5,092
West Cedar Butte	T. 09 N., R. 34 E. Sec. 23-26	764
Total Acres		70,320

*Boise Meridian

Conformance with the Applicable Land Use Plans

The Proposed Action and action alternatives are in conformance with the following landscape-level objectives and management actions set forth in the Record of Decision for the *Big Desert Management Framework Plan* (DOI-BLM 1981) and *Medicine Lodge Resource Management Plan* (DOI-BLM 1985) as amended by the *Fire, Fuels, and Related Vegetation Management Direction Plan Amendment (FMDA)* and *Final Environmental Impact Statement and Record of Decision* (DOI-BLM 2008). The purpose of the amendment was to incorporate fire, fuels, and

related vegetation management direction that is consistent with the Federal Wildland Fire Management Policy including the decision to “...maintain, or restore vegetation that would support special status species (SSS) habitat and healthy, diverse, and sustainable vegetative communities” (DOI-BLM 2008). Additionally, the Proposed Action and action alternatives are consistent with the *Idaho and Southwestern Montana Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement* (DOI-BLM and USDA-USFS 2015) which address the management of Greater Sage-Grouse habitat in Idaho and portions of Montana and Utah.

The FMDA and Final Environmental Impact Statement Record of Decision set objectives and management actions which follow:

Objective 1 - Make Progress toward Desired Future Conditions (DFC) in the Low-elevation Shrub, Perennial Grass, Invasive Annual Grass, Mid-elevation Shrub, Mountain Scrub, and Juniper vegetation types.

Management Actions:

- Use chemical, mechanical, seeding, and prescribed fire treatments as appropriate to achieve DFC.
- In perennial grass, invasive annual grass, and juniper-invaded cover types, restore sagebrush steppe with an aggressive sagebrush seeding effort, using the appropriate sagebrush subspecies for the treatment.
- Strategically place treatments on a landscape scale to prevent fire from spreading into important sagebrush steppe habitat or WUI.

Objective 2 – Maintain, protect, and expand sage grouse source habitats.

Management Actions:

- Conduct vegetation treatments in areas that pose a wildland fire risk to source habitats.
- Treat areas within source habitats that have a low resiliency (i.e., areas characterized by low species diversity, undesirable composition, and dead or decadent sagebrush).

Objective 3 – Treat sage-grouse key and restoration habitats to expand source habitats. Improve and maintain sage-grouse restoration and key habitats.

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Management Actions:

- Conduct vegetative treatments in restoration and key habitats to reduce risk of wildland fire and reconnect restoration and key habitats.
- Treat areas of restoration and key habitats that have low resiliency characterized by low species diversity.

The Idaho and Southwestern Montana Greater Sage-Grouse Proposed LUPA and Final EIS set objectives and management actions which follow:

Vegetation

Objective 1 – Reconnect and expand areas of higher native plant community integrity/rangeland health to increase the extent of high quality habitat and, where possible, to accommodate the future effect of climate change.

Objective 2 – Increase the amount and functionality of seasonal habitats by:

- Increase or enhance canopy cover and average patch size of sagebrush.
- Increase the amount, condition and connectivity of seasonal habitats.
- Increase understory (grass, forb) and/or riparian condition within breeding and late brood-rearing habitats.
- Reduce the extent of annual grasslands within and adjacent to PHMA and IHMA.

Vegetation Management Actions:

- *VEG-1:* Implement habitat rehabilitation or restoration projects in areas that have potential to improve GRSG habitat using a full array of treatment activities as appropriate, including chemical, mechanical and seeding treatments.
- *VEG-2:* Implement vegetation rehabilitation or manipulation projects to enhance sagebrush cover or to promote diverse and healthy grass and forb understory to achieve the greatest improvement in GRSG habitat based upon FIAT Assessments.....
- *VEG-3:* Require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success (Richards et al. 1998). Non-native seeds may be used as long as they support GRSG habitat

objectives (Pyke 2011) to increase probability of success, when adapted seed availability is low or to compete with invasive species especially on harsher sites.

Wildland Fire Management

Objective 1 – Design fuel treatments to restore, enhance, or maintain GRSG habitat.

Fuels Management Actions:

- *FM-2:* Enhance (or maintain/retain) sagebrush canopy cover and community structure to match expected potential for the ecological site and consistent with GRSG habitat objectives unless fuels management objectives requires additional reduction in sagebrush cover to meet strategic protection of GRSG habitat.....
- *FM-6:* Fuel treatments will be designed through an interdisciplinary process to expand, enhance, maintain, and protect GRSG habitat which considers a full range of cost effective fuel reduction techniques, including: chemical, biological (including grazing and targeted grazing), mechanical and prescribed fire treatments.
- *FM-13:* Prioritize the use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low or non-economical, nonnative seeds may be used to meet GRSG habitat objectives to trend toward restoring the fire regime.

Relationship to Statutes, Regulations, and other Applicable Plans

The Proposed Action and action alternatives are consistent with the *Conservation Plan for the Greater Sage-grouse in Idaho* (2006) objective to, “Maintain, enhance or restore sage grouse habitat, and continuity of habitats, at multiple spatial scales (ISGAC 2006: 1-13)”. The Proposed Action and action alternatives are also consistent and incorporate policies, procedures, and BMPs found within the Big Desert Sage-grouse Local Working Groups Sage-Grouse Conservation Plan (BDLWG) and the Upper Snake Sage-grouse Local Working Group’s Plan (USLWG) for Increasing Sage-grouse Populations. These plans recommend actions to:

- “maintain, rehabilitate, and restore sage-grouse habitats and the continuity of their habitats within the Big Desert Sage-grouse Planning Area (BDLWG 2010:1)”
- “manage the sagebrush steppe ecosystems within the Big Desert Sage-grouse Planning Area for a diverse species composition of sagebrush, grasses, and forbs; and incorporate

structural characteristics that promote rangeland health and sage-grouse habitat requirements (BDLWG 2010:1)”

- *“restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs (BDLWG 2010:13)”*
- *“manage the density, structure, and composition of shrubs, forbs, and grasses at a standard that will maintain the long-term health and sustainability of the plant community, enhance the long term health of sage-grouse habitats, and meet the needs of other species and human uses (USLWG 2009:8)”*
- *“all land management agencies identify areas in fair or poor ecological condition and prioritize areas for implementation of restoration activities (USLWG 2009:13)”*
- *“all land management agencies restore degraded rangelands to a condition that again provides suitable breeding habitat for sage-grouse by including sagebrush, native forbs (especially legumes), and native grasses in re-seeding efforts (USLWG 2009:14)”*

Actions proposed under this EA have incorporated the conservation policies, procedures and Best Management Practices (BMPs) found within the *Greater Sage-grouse Interim Management Policies and Procedures* (DOI-BLM IM-2012-043) and *Sage-grouse Conservation in Fire Operations and Fuels Management* (DOI-BLM IM-2013-128) instruction memorandums which pertain to fuels-related vegetation treatments within Greater Sage-grouse Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH). This guidance emphasizes the use of BMPs for the purpose of identifying, enhancing, and conserving sage-grouse habitats by protecting existing patches, modifying fire behavior and restoring native plants. This guidance recommends to:

- “Coordinate, plan, design, and implement vegetation treatments and associated effectiveness monitoring between Resources, Fuels Management, Emergency Stabilization, and Burned Area Rehabilitation programs to:
 - Promote the maintenance of large intact sagebrush communities;
 - Limit the expansion or dominance of invasive species, including cheatgrass;
 - Maintain or improve soil site stability, hydrologic function, and biological integrity; and
 - Enhance the native plant community, including the native shrub reference state in the State and Transition Model, with appropriate shrub, grass, and forb composition identified in the applicable ESD where available (DOI-BLM IM-2012-043:3).”

- “Design fuels treatment objectives to protect existing sagebrush ecosystems, modifying fire behavior, restoring native plants, and creating landscape patterns which most benefit sage-grouse habitat (DOI-BLM IM-2013-128: Attachment 3-1).”
- As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation (DOI-BLM IM-2013-128: Attachment 3-10).”
- Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions. (DOI-BLM IM-2013-128: Attachment 3-11).”

The management of invasive species/noxious weeds in relation to the Proposed Action and action alternatives are governed by the *Upper Snake-Pocatello Integrated Weeds Control Programmatic Environmental Assessment* (DOI-BLM 2009). The control program, which utilizes a full complement of methodologies available to treat weeds (i.e., herbicide use, fire, mechanical, manual, and biological control) tiers to the *Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement 2007* (DOI-BLM 2007).

This EA also tiers to the analysis presented in the *FMDA and Final Environmental Impact Statement* (DOI-BLM 2008). The plan amendment assesses the environmental effects of mechanical, prescribed fire, and chemical fuel treatments. The analysis in the FMDA contains broad regional descriptions of resources, provides a broad environmental impact analysis, including cumulative impacts, focuses on general policies and provides Bureau-wide decisions for vegetation management.

Scoping, Issues, and Decision to be Made

Scoping

Internal scoping meetings were conducted by an interdisciplinary team (IDT) of BLM specialists to discuss the purpose and need of the project; alternatives; resources of concern; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures.

Issues

Through the scoping process, the BLM IDT identified the following issues concerning the Sagebrush Steppe Restoration Habitat Improvement Project:

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Upland vegetation and watershed conditions

Sage-grouse habitat conditions

Big game habitat conditions

Cultural site protection

Noxious and invasive weeds

Decision to be Made

The Upper Snake Field Manager is the authorized officer responsible for the decisions regarding management of public lands within the 11 treatment units that makeup the Sagebrush Steppe Restoration project area. If the authorized officer determines that it is not necessary to prepare an EIS, the EA will provide information for the authorized officer to make an informed decision whether to allow the implementation of the various treatments and if allowed, which management actions, mitigation measures, and monitoring requirements will be prescribed for the project to ensure management objectives are met.

CHAPTER 2- THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes and compares the alternatives considered by the IDT for vegetation treatments proposed for public lands within the project area. The alternatives were developed by the IDT based on issues identified during internal and external scoping, understanding of the purpose and need for the project, and experience with restoration projects at other locations within the USFO. As this project progressed from conceptualization to alternative description, refinements to the action alternatives were made to minimize the potential for adverse effects, as described below. Different types of vegetation restoration treatments are being proposed to address the differences within plant communities, soils and slopes present within the USFO, and are designed to improve the native vegetation composition and structure found within those areas.

Alternative A: The Proposed Action

Under the Proposed Action, 11 treatment units totaling 70,320 acres would be treated with the intent of increasing sagebrush cover, improving native understory vegetation and reducing cheatgrass. Within the treatment footprint, 47,470 acres would be seeded via drilling or aerial application with native herbaceous (grasses and forbs) vegetation and 25,440 acres would be chemically treated to reduce cheatgrass dominance. Additionally, selected areas within each of the treatment units would be strategically hand planted with sagebrush seedlings using augers to promote the repopulating of the site by sagebrush (see Appendix A, Map 2). These methods would include:

Sagebrush Hand Planting

Sagebrush seedlings would be planted at an approximate density of 100 seedlings per acre with a minimum spacing of 10 feet. Some soil disturbance would occur as a result of the planting process. The disturbance would vary in size depending on the type of seedling being planted, (e.g., bare root or containerized). Generally, three inch diameter earth augers would be used to establish holes for seedlings. If enough soil cannot be obtained to properly plant the seedling, an auxiliary hole would be drilled within the vicinity. Hoedads or planting bars may also be used in place of earth augers if site conditions are not favorable. Additionally, the use of 4-wheel drive and all-terrain vehicles may be needed to facilitate the transport of materials and equipment to the planting sites.

Areas susceptible to livestock grazing impacts or ground disturbance from unauthorized OHV use may be temporarily fenced to reduce impacts on seedlings following treatment. Temporary

fence construction would consist of two or three strand electric wire with reflective markers placed on the top wire to reduce collision potential of avian species. Additionally, the use of protective Tubex shields could be used around individual plants in areas where wildlife herbivory is identified as a potential threat to the success of the treatment.

Native Herbaceous Seeding

The native seeding would involve seeding degraded areas with native grasses and forbs. These seedings are needed to restore native plant diversity and structure to the area. Whether this treatment is implemented via drilling or aerial application followed by harrowing, it is likely to result in some degree of surface disturbance. The implementation of this treatment may follow the chemical treatment(s) of cheatgrass (see *Chemical Cheatgrass Reduction*) that are needed to reduce the annual grass density and competition. Both seeding methods would be implemented during the early fall at a rate and mixture of native vegetation that would result the highest likelihood of success (Table 2).

Treated areas would be closed to livestock grazing to allow for adequate establishment of the seeded species. Approximately 20 miles of temporary electric fencing could be constructed within those allotments (Stage Road, Valley, West Cedar Butte, Mesa, Camas Butte and North Butte) where drill seeding treatments would occur, while in the Jefferson seeding area (Twin Buttes Allotment) and southern end of the Stage Road seeding area (Big Desert Sheep Allotment), sheep operators would be instructed to keep herds out of the newly seeded areas (see Appendix A, Maps 3 & 4). Temporary fence construction would consist of two or three strand electric wire with reflective markers placed on the top wire to reduce collision potential of avian species. Within the remaining allotments, Hells Half Acre and Buck Springs, pastures would be temporarily closed until seeded areas have met treatment objectives. Livestock grazing would continue following an evaluation by an interdisciplinary team. Grazing at pre-treatment authorization levels would resume within the treated portions of the allotments once vegetation monitoring shows that perennial herbaceous cover is at least 70% of what is found in the adjacent reference area for that specified ecological site, and 50% of the herbaceous perennial plants are producing seed. Additionally, the team would consider plant vigor, stability of the treatment area, and overall seeding success.

Table 2: Seeded Species and Rates of Application under the Proposed Action.

Species		Common Name	Drill Seeding (lb/ac) (1) (2)	Aerial Seeding (lb/ac) (1) (3)	Comments
Grasses	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	3	6	Long-lived, perennial bunchgrass with good palatability for wildlife. Best adapted to 10-20 inch precipitation zones. Drought resistant, aids in soil stabilization and is an important component of sage-grouse habitat.
	<i>Elymus wawawaiensis</i>	Snake River Wheatgrass	3	6	Long-lived, perennial bunchgrass. Best adapted to 10-20 inch precipitation zones. Very drought tolerant bunchgrass that is desirable for erosion control. Highly palatable and has a high protein content.
	<i>Achnatherum hymenoides</i>	Indian Ricegrass	1	2	Drought tolerant bunchgrass that is desirable for erosion control. Best adapted to 8-14 inch precipitation zones. Important component of sage-grouse habitat, is highly palatable and has a very high protein and fat content
	<i>Elymus elymoides</i>	Bottlebrush Squirreltail	1	2	Drought tolerant short-lived bunchgrass that is an important component of sage-grouse habitat. Best adapted to 5-10 inch precipitation zones. An early seral species that outcompetes annual weedy species.
	<i>Poa ampla</i>	Big Bluegrass	1	2	Long-lived, perennial bunchgrass with good palatability for wildlife and competes well with winter annual weeds. Best adapted to 10-24 inch precipitation zones.
Forbs	<i>Linum lewisii</i>	Lewis Flax	0.5	1	Provides some forage value and good erosion control. Best adapted to 10-18 inch precipitation zones.
	<i>Penstemon palmeri</i>	Palmer's Penstemon	0.5	1	Used for restoration and wildlife enhancement plantings. Selectively used as forage by small birds, big game and livestock. Best adapted to 10-16 inch precipitation zones.
	<i>Astragalus filipes</i>	Basalt Milvetch	0.5	1	A component of sage-grouse habitat. Best adapted to 8-30 inch precipitation zones.
	<i>Sphaeralcea coccinea</i>	Scarlet Globemallow	0.5	1	Long-lived forb that is used for restoration and provides excellent forage for big game. Best adapted to 6-10 inch precipitation zones.
Total lb/ac.			11	22	

Notes

(1) Application rates are derived from BLM and NRCS Plant Guides for the purpose of mixed species establishment. Actual application rates will vary depending upon seed availability and funding.

(2) Based on a drill-seeding rate of 12 lb. pure live seeds/acre. Rate should be doubled for broadcast or hydro-seeding.

(3) Based on a broadcast or hydro-seeding rate of 24 lb. pure live seeds/acre. Rate should be halved for drill-seeding.

Chemical Cheatgrass Reduction (Specific to the Stage Road Treatment Area)

Chemical treatments would involve the application of herbicides at certain plant growth stages that would result in the demise of the plant. Chemical application(s) are required to reduce or eliminate the anticipated growth and competition of cheatgrass prior to fall plantings and

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seedlings. The area would be sprayed with a single or combination of herbicides (Table 3). Two or more treatments may be necessary due to the large amount of cheatgrass seed within the seed bank. Subsequent applications are dependent on the environmental conditions occurring during the late spring/early summer. As a result, the timing of the chemical treatments would need to be flexible in order to maximize the effectiveness of the treatment. It is anticipated that at least two chemical treatments would be needed in the spring. The herbicide(s) would be applied according to the application rate identified on the chemicals label. To reduce the potential for drift and offsite application the site would be sprayed within four hours of sunrise when wind velocities are less than five mile per hour (5 MPH). The desired post-treatment density of the cheatgrass would be approximately five plants per square foot.

Table 3. Herbicides Proposed for Use under the Proposed Action.

Herbicide	Herbicide Characteristics
2,4-D	Selective; foliar absorbed; post-emergent; annual/perennial broadleaf weeds.
Chlorsulfuron	Selective; inhibits enzyme activity, broadleaf weeds and grasses.
Clopyralid	Selective, mimics plant hormones; annual and perennial broadleaf weeds.
Dicamba	Growth regulator; annual and perennial broadleaf weeds and grasses.
Glyphosate	Non-selective, annual and perennial grasses and broadleaf weeds, sedges, shrubs, and trees.
Metsulfuron methyl	Selective; post-emergent; inhibits cell division in roots and shoots; annual and perennial broadleaf weeds, brush, and trees.
Picloram	Selective; foliar and root absorption; mimics plant hormones; certain annual and perennial broadleaf weeds, vines, and shrubs.
Tebuthiuron	Relatively non-selective soil activated herbicide; pre and post-emergent control of annual and perennial grasses, broadleaf weeds and shrubs.
Triclopyr	Growth regulator; broadleaf weeds and woody plants.
Imazapic	Selective post-emergent herbicide; inhibits broadleaf weeds and some grasses.
<i>Pseudomonas fluorescens</i> strain D7 bacterium	Selectively inhibits cheatgrass by colonizing the roots and producing root-suppressive compounds that decrease seedling vigor and the number of tillers and seeds produced.

*The application of D7 would be limited to no more than 50 acres for the purpose of conducting field tests on the viability and effectiveness of the chemical. Should this biological control agent become approved for public land application this document would allow for the large scale application of this product on those lands identified within this environmental assessment.

Details of the various actions to be implemented under the Proposed Action are summarized in Table 4 by treatment unit.

Table 4: Summary of Treatment Objectives, Methods and Acres by Treatment Unit(s).

Treatment Unit(s)	Acres	Treatment Method	Treatment Objectives
Twin Buttes Fred Butte Deadman Native Table Legs Butte Table Butte	22,850	<ul style="list-style-type: none">• Hand Plant Sagebrush Seedlings	<ul style="list-style-type: none">• Establish seed sources that can further aid in the reestablishment of the sites.• Transition the vegetation structure and composition towards FRCC 1.• Improve wildlife habitat by enhancing native species diversity and increasing sagebrush densities.
Jefferson Fire West Cedar Butte Camas Butte Mesa Hells Half Acre Stage Road	47,470	<ul style="list-style-type: none">• Hand Plant Sagebrush Seedlings• Native Grass & Forb Drill Seeding• Chemically Reduce/Remove Cheatgrass	<ul style="list-style-type: none">• Reduce the threat of uncharacteristic wildland.• Transition the fire regime and vegetation structure and composition towards FRCC 1.• Establish seed sources that can further aid in the reestablishment of the sites.• Improve wildlife habitat by increasing native herbaceous and shrub species diversity.• Chemically treat non-native annual grasses to reduce competition to native vegetation.

Alternative B: Non-native Seeding Alternative

Under Alternative B, a single treatment area, Stage Road, totaling 25,440 acres would be treated with the intent of improving the overall ecological condition of the site by increasing the herbaceous and woody vegetation that is degraded due to repeated wildfires. All 25,440 acres would be treated through a combination of sagebrush seedling plantings, non-native grass seedlings and chemical cheatgrass reduction treatments (see Appendix A, Map 5). These methods would include:

Sagebrush Hand Planting

Sagebrush seedlings would be planted at an approximate density of 100 seedlings per acre with a minimum spacing of 10 feet. Some soil disturbance would occur as a result of the planting process. The disturbance would vary in size depending on the type of seedling being planted, (e.g., bare root or containerized). Generally, three inch diameter earth augers would be used to establish holes for seedlings. If enough soil cannot be obtained to properly plant the seedling, an auxiliary hole would be drilled within the vicinity. Hoedads or planting bars may also be used in place of earth augers if site conditions are not favorable. Additionally, the use of 4-wheel drive and all-terrain vehicles may be needed to facilitate the transport of materials and equipment to the planting sites.

Areas susceptible to livestock grazing impacts or ground disturbance from unauthorized OHV use may be temporarily fenced to reduce impacts on seedlings following treatment. Temporary fence construction would consist of two or three strand electric wire with reflective markers placed on the top wire to reduce collision potential of avian species. Additionally, the use of protective Tubex shields could be used around individual plants in areas where wildlife herbivory is identified as a potential threat to the success of the treatment.

Native/Non-native Herbaceous Seeding

The native/non-native seeding would involve the seeding of degraded areas with a mix of native and non-native grasses. This seeding is needed to provide a source of perennial grasses that would eventually out-compete cheatgrass, stabilize the soil and increase plant diversity and structure to the area. Whether this treatment is implemented via drilling or aerial application followed by harrowing, it is likely to result in some degree of surface disturbance. The implementation of this treatment would follow the chemical treatment(s) of cheatgrass (see *Chemical Cheatgrass Reduction*) that are needed to reduce the annual grass density and competition. Both seeding methods would be implemented during the early fall at a rate and mixture of seeds that would result the highest likelihood of success (Table 5).

Treated areas would be closed to livestock grazing to allow for adequate establishment of the seeded species. Approximately eight miles of temporary electric fence would be constructed within the Stage Road treatment area to protect the seedlings from livestock use (see Appendix A, Map 5). Temporary fence construction would consist of two or three strand electric wire with reflective markers placed on the top wire to reduce collision potential of avian species. Livestock grazing would continue following an evaluation by an interdisciplinary team. Grazing at pre-treatment authorization levels would resume within the treated portions of the allotments once vegetation monitoring shows that perennial herbaceous cover is at least 70% of what is found in the adjacent reference area for that specified ecological site, and 50% of the herbaceous perennial plants are producing seed. Additionally, the team would consider plant vigor, stability of the treatment area, and overall seeding success.

Table 5: Seeded Species and Rates of Application - The following seed mix is formulated specifically for the Stage Road treatment unit.

Species		Common Name	Drill Seeding (lb/ac) (1) (2)	Aerial Seeding (lb/ac) (1) (3)	Comments
Grasses	<i>Elymus wawawaiensis</i>	Snake River Wheatgrass	5	10	Long-lived, perennial bunchgrass. Best adapted to 10-20 inch precipitation zones. Very drought tolerant bunchgrass that is desirable for erosion control. Highly palatable and has a high protein content.
	Siberian Wheatgrass	<i>Agropyron fragile</i>	5	10	Long-lived, perennial bunchgrass with good palatability for wildlife. Resists cheatgrass competition better than most natives, due to earlier germination at colder temperatures. Best adapted to 8-16 inch precipitation zones. Drought resistant, establishes quickly and aids in soil stabilization.
	Western Wheatgrass	<i>Pascopyrum smithii</i>	1	2	Long-lived and spreads via rhizomes. It is well adapted to a variety of soils and works best as part of a seed mix. Best adapted to 12-20 inch precipitation zones.
	Streambank Wheatgrass	<i>Elymus lanceolatus</i> spp. <i>lanceolatus</i>	1	2	Long-lived, perennial bunchgrass with good palatability for wildlife and livestock. Best adapted to 8-20 inch precipitation zones. Drought resistant, establishes quickly and aids in soil stabilization.
Total lb/ac.			12	24	

Notes

- (1) Application rates are derived from BLM and NRCS Plant Guides for the purpose of mixed species establishment. Actual application rates will vary depending upon seed availability and funding.
(2) Based on a drill-seeding rate of 12 lb. pure live seeds/acre. Rate should be doubled for broadcast or hydro-seeding.
(3) Based on a broadcast or hydro-seeding rate of 24 lb. pure live seeds/acre. Rate should be halved for drill-seeding.

Chemical Cheatgrass Reduction (Specific to the Stage Road Treatment Area)

Chemical treatments would involve the application of herbicides at certain plant growth stages that would result in the demise of the plant. Chemical application(s) are required to reduce or eliminate the anticipated growth and competition of cheatgrass prior to fall plantings and seedings. The area would be sprayed with a single or combination of herbicides (Table 3). Two or more treatments may be necessary due to the large amount of cheatgrass seed within the seed bank. Subsequent applications are dependent on the environmental conditions occurring during the late spring/early summer. As a result, the timing of the chemical treatments would need to be flexible in order to maximize the effectiveness of the treatment. It is anticipated that at least two chemical treatments would be needed in the spring. The herbicide(s) would be applied according to the application rate identified on the chemicals label. To reduce the potential for drift and offsite application the site would be sprayed within four hours of sunrise when wind velocities

are less than five mile per hour (5 MPH). The desired post-treatment density of the cheatgrass would be approximately five plants per square foot.

Details of the actions to be implemented under Alternative B are summarized in Table 6 by treatment unit.

Table 6: Summary of Treatment Objectives, Methods and Acres by Treatment Unit.

Treatment Unit(s)	Acres	Treatment Method	Treatment Objectives
Stage Road	25,440	<ul style="list-style-type: none"> • Hand Plant Sagebrush Seedlings • Native/Non-native Grass & Forb Drill Seeding • Chemically Reduce/Remove Cheatgrass 	<ul style="list-style-type: none"> • Reduce the threat of uncharacteristic wildland. • Transition the fire regime and vegetation structure and composition towards FRCC 1. • Establish seed sources that can further aid in the reestablishment of the sites. • Improve wildlife habitat by increasing herbaceous and shrub species diversity. • Chemically treat non-native annual grasses to reduce competition to native vegetation.

Alternative C: The No Action Alternative

Under the No Action Alternative, sagebrush steppe restoration and cheatgrass control would not be conducted on any of the previously mentioned sites. The No Action Alternative precludes attainment of management objectives identified in the various land use plans and amendments for improving or maintaining ecological conditions. The No Action Alternative also does not meet the project objectives for biodiversity, establishment or maintenance of desirable plant species, wildlife forage and habitat needs.

Design Features Covering All Action Alternatives

- To avoid the spread of noxious weeds, no cross country vehicular travel would occur through areas with known noxious weed infestations. Additionally, prior to ground-disturbing activities, all mechanical equipment and vehicles would be cleaned of all vegetation (stems, leaves, seeds, and all other vegetative parts) in order to minimize the transport and spread of invasive plants seeds.
- The use of certified weed-free seed mixes would be required to prevent the introduction of invasive plants.
- As funding allows, the treatment areas would be monitored for the presence of noxious weed species prior to and following implementation. Any weeds that are identified

would be treated in accordance with the *Upper Snake-Pocatello Integrated Weeds Control Programmatic Environmental Assessment* (DOI-BLM 2009).

- Ground-disturbing treatments would only occur between July 1 and December 31 so as to minimize impacts to sage-grouse, migratory birds and other wildlife species unless previously cleared by a wildlife biologist.
- A Class III inventory would be completed prior to the implementation of activities that may have an effect on cultural resources. All eligible or potentially eligible archaeological sites would be flagged prior to any ground-disturbing activities to avoid adverse effects. Sites that are located in areas proposed for treatment would be avoided.
- Should any sensitive plants be identified within the project area, sites would be flagged prior to any ground-disturbing activities to avoid adverse effects. Sites that are located in areas proposed for treatment would be avoided.
- Temporary Fence Construction
 - Fence projects would be accessed using existing roads and trails.
 - Cross-country travel would be restricted to the actual fence route.
 - Only rubber-tired vehicles would be used during fence construction, alteration, or maintenance.
 - Wildlife Timing Stipulations - Construction timing restrictions would be established by the Authorized Officer to reduce impacts to wildlife species during critical breeding, nesting, or wintering periods, unless previously cleared by a wildlife biologist, and would meet site-specific needs of affected wildlife species. Wildlife timing stipulations would include:
 - Construction activities would not occur within crucial wildlife winter ranges between the dates of November 15 and April 30.
 - Spring construction activities (March 1 to May 15) would be limited to between the hours of 9:00 am and 6:00 pm to avoid disturbing lekking sage-grouse.
 - Construction activities potentially disruptive to nesting greater sage/sharp-tailed grouse are prohibited during the period of May 1 to June 30 for the protection of strutting and nesting areas.
 - Fence modification would be postponed if soils become saturated or ruts are produced by vehicles.

- All existing legal public vehicular and walk-in access areas would be maintained regardless of type of fence constructed.
- Fences constructed along the Stage Road (Goodale's Cutoff) would be offset a minimum of 150 feet from the road to protect cultural resources.

Alternatives Considered but not Analyzed

Seeding without removing the cheatgrass layer (Specific to the Stage Road Treatment Unit)

This alternative was considered and rejected because it would not meet the previously described purpose and need. Cheatgrass has a competitive advantage over other perennial plants due to early germination and establishment. While there has been some success in seeding crested wheatgrass directly into heavy cheatgrass thatch, the seeding of other perennial plants, specifically native perennials, would have a low probability of success. Therefore, this alternative was not carried forward in the analysis.

Broadcast seeding without burying

This alternative was considered and rejected because the probable success of grass becoming established without good seed to soil contact is very low. Past attempts at broadcast seeding without burying seed have been met with limited success due to the fact that grass species have a difficult time becoming established if placed and left uncovered on arid soils. A heavy cheatgrass thatch would preclude this. As a result, this alternative was not carried forward in the analysis.

Burying of seed by livestock

This alternative was considered and rejected because of the size of the project area, and the large number of animals required to trample an area would not be available nor would it be logistically possible. As a result, this alternative was not carried forward in the analysis.

Using prescribed fire to prepare seedbeds

The use of broadcast prescribed fire as a means to reduce cheatgrass was initially considered. This method would require the use of hand crews and heavy equipment to develop fire control lines to contain the prescribed fire treatments. Prescribed fire would increase the inadvertent damage to non-target plant communities through either the creation of fire control lines or through the direct ignition of the prescribed fire. This would subsequently harm Greater sage-grouse and other sagebrush obligate species by further reducing Wyoming and basin big sagebrush cover that is currently limited due to previous wildfire disturbances. Furthermore, the

results of a cost analysis indicated that the revenues required to repeatedly mobilize crews and equipment to prepare and ignite treatment areas would be far greater than utilizing other types of less risky, more easily controlled treatments. While fire is an important ecological component of this and many other ecosystems it is understood that implementing prescribed fire treatments in Wyoming and basin big sagebrush habitats may not be a viable option due to the inability to control fire in a way to meet the goals and objectives of this restoration effort. As a result, this alternative was not carried forward in the analysis.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter provides a description of the general environmental setting and resources within that setting that could be affected by the Proposed Action and alternatives. In addition, the section presents an analysis of the direct, indirect, and cumulative impacts likely to result from the implementation of the two alternatives.

General Setting

The Upper Snake Sagebrush Steppe Restoration Project is located in southeastern Idaho within the Upper Snake River Plain. The 70,320 acre project area is comprised entirely of Bureau of Land Management (BLM)-administered public lands, with treatment areas residing within Bingham, Bonneville, Butte, Clark, Jefferson and Power Counties. The topography of the project area consists of gently rolling lava plains with associated basalt bluffs and outcroppings. Elevations range from 4,500 feet on the southern end of the project area to over 5,800 feet above sea level on the northern end. The annual precipitation in the individual treatment areas ranges between 8-12 inches, while temperatures range between 92°F for a high and -1°F for a low.

Resources Considered in the Impact Analysis

The results of the assessment indicate that not all of the resources considered are present and/or would be impacted by the Proposed Action and alternative (Table 7). Direct and indirect impacts to those resources that are present and impacted are discussed in the following narratives. Cumulative impacts are discussed in a subsequent section.

Table 7. Resources Considered in the Impact Analysis.

Resource	Resource Status	Rationale
Access	Present, Not Impacted	The Proposed Action and alternatives would not result in changes in access to the area because no new access roads or trails would be authorized and all use would be restricted to existing roads.
Air Quality	Present, Impacted	Impacts are disclosed under Air Quality .
Areas of Critical Environmental Concern (ACEC's)	Not Present	The proposed project area is not located within or near an ACEC.
Cultural Resource	Present, Impacted	Programmatic consultation under the National Historic Preservation Act of 1966 (as amended) has been conducted in accordance with the BLM National Programmatic Agreement and the implementing Protocol agreement between Idaho BLM and the Idaho State Historic Preservation Office (ID-SHPO). Impacts are disclosed under Cultural Resources .
Economic and Social Values	Present, Impacted	Impacts are disclosed under Economic and Social Values .
Environmental Justice	Not Present	There are no minority or low income populations residing near the proposed project area. Therefore, populations as described under Executive Order 12898 of 2/11/1994 would not be affected.
Existing and Potential Land Uses	Present, Not Impacted	The Proposed Action and alternatives would not affect any current uses and potential uses of land. Uses include ROWs, Land Use Permits, grazing allotment, etc.
Fisheries	Not Present	There are no fisheries or fish-bearing streams within the project area.
Floodplains	Not Present	There are no floodplains on public lands within the project area.
Forest Resources	Not Present	There are no forests on public lands within the project area.
Invasive, Non-Native Species	Present, Impacted	Impacts are disclosed under Invasive, Non-Native Species .
Mineral Resources	Present, Not Impacted	The Proposed Action and alternatives would have no impact on mineral resources within the area.
Migratory Birds	Present, Impacted	Impacts are disclosed under Wildlife Resources .
Native American Religious Concerns	Not Present	There are no known ceremonial sites or resources associated with ceremonial practices within the project area.
Paleontological Resources	Not Present	There are no known paleontological resources located within the project area.
Prime and Unique Farmlands	Not Present	There are no prime or unique farmlands located within the project area.
Range Resources	Present, Impacted	Impacts are disclosed under Range Resources .
Recreational Use	Present, Not Impacted	No recreational use impacts have been identified under the Proposed Action or alternatives. Uses include hunting, biking, camping, OHV, etc.
Soils	Present, Impacted	Impacts are disclosed under Soils .
Threatened, Endangered, and Sensitive Plants	Not Present	There are no known Threatened, Endangered, or Sensitive plants located within the project area.

Resource	Resource Status	Rationale
Threatened, Endangered, and Sensitive Animals	Present, Impacted	Impacts are disclosed under Wildlife Resources .
Threatened, Endangered, and Sensitive Fish	Not Present	There are no waters in the area that support Threatened, Endangered, or Sensitive Fish.
Tribal Treaty Rights and Interests	Present, Impacted	Impacts are disclosed under Tribal Treaty Rights and Interests .
Vegetation	Present, Impacted	Impacts are disclosed under Vegetation .
Visual Resources	Present, Not Impacted	The treatment units that make up the project area lie primarily within VRM Class II and/or III designations. The degree of contrast between the elements and features were primarily determined to have no contrast. The treatment units would have no contrast to the land features. The vegetation feature displayed a weak and/or no contrast with both the color and texture elements and moderate contrast with the form. Based on this degree of contrast, it is determined that the project meets VRM Class II and III objectives and would not dominate the view of the casual observer.
Wastes, Hazardous and Solid	Not Present	There are no solid or hazardous wastes in the project area and none would be created during the implementation of the Proposed Action or alternatives.
Water Quality (Surface and Ground)	Not Present	There is no surface water within the project area and implementation of the Proposed Action or alternatives would not result in impacts to ground water quality.
Wetland and Riparian Zones	Not Present	There are no Wetland and Riparian areas within or near the project area.
Wild and Scenic Rivers	Not Present	There are no wild and scenic rivers within or near the project area.
Wild Horse and Burro HMAs	Not Present	There are no wild horse and burro HMAs in the region.
Wilderness	Not Present	There are no wilderness areas or WSA's within the area.
Wildlife	Present, Impacted	Impacts are disclosed under Wildlife Resources .

Direct and Indirect Impacts

Air Quality

Affected Environment

The Sagebrush Steppe Restoration project area lies within a Prevention of Significant Deterioration (PSD) Class II Area, designated under the Clean Air Act as an area with reasonable or moderately good air quality. Under this class designation, moderate industrial growth is permissible.

Data from the Idaho Department of Environmental Quality's monitoring station in Idaho Falls indicates that the National Ambient Air Quality Standards (NAAQS) for particulate matter PM_{2.5} was not exceeded at any point during the past two years.

Environmental Consequences

Alternative A (Proposed Action)

Section 4.6.2.1 in the FMDA EIS discloses air quality impacts from chemical, mechanical, and seeding treatments. These impacts include the production of localized PM₁₀ and PM_{2.5} emissions from ground-disturbance and removal of vegetation. Given the relatively small-scale of the project and the incremental nature of its implementation, it is unlikely that there would be any lasting measureable effect on local air quality. Under the Proposed Action, these types of effects would be minimized by conducting ground-disturbing activities in the late fall and winter when soils are frozen and snow covered (see ***Design Features***).

Herbicide application affects the immediate air quality of those applying the herbicide. Thus, herbicides would be applied following the manufacturer's recommendations and BLM guidelines and procedures. Herbicides are not anticipated to have non-localized air quality affects.

While the implementation of this alternative may lead to short-term increase in fugitive dust emissions, specifically during ground seeding operations, the impacts would not be long lasting. Overall, the impacts would be beneficial to air quality because the treatments would lead to reductions in bare ground and increases in understory herbaceous vegetation and overstory shrub cover and may help to limit the duration and extent of wildfire in the area, thereby limiting PM₁₀, PM_{2.5} from fugitive dust and smoke emissions.

Alternative B (Native/Non-native Seeding)

Impacts under Alternative B would be the same as those discussed under Alternative A.

Alternative C (No Action Alternative)

The No Action alternative would not directly generate air quality impacts since ground-disturbing treatments would not occur. However the effects of this alternative would lead to more frequent occurrences of wildfire specifically within the cheatgrass dominated treatment units, and the fires that do burn would be larger, more damaging, create significantly more smoke and may lead to longer periods of lower air quality. Additionally, in those treatments units where ground cover is a limiting factor wind events may lead to further soil movement resulting in higher PM_{2.5} values from fugitive dust.

Cultural Resources

Affected Environment

A Class I literature review was conducted to assess the effects of the proposed project on cultural resources. A Class I review of site and inventory GIS databases and other pertinent historic documentation including General Land Office (GLO) plat maps was conducted.

There have been 16 previous inventories conducted within the Area of Potential Effect (APE) for the 70,320 acres with proposed treatments. These Class III inventories have been conducted within the APE between the years 1992 and 2013 (Tables 8-9). Within the APE identified for vegetation treatments including only hand planting, approximately 3% (672 acres) has been inventoried for cultural resources. Within the APE identified for vegetation treatments including: hand planting, native seeding, and chemical treatments, approximately 39% (18,349 acres) has been inventoried for cultural resources within the APE.

Table 8: Previous Cultural Resource Inventories within the Area of Potential Effect (APE) for Hand Planting.

Year	Class of Inventory	Cultural Resource Inventory Report Title	Acres Inventoried	Cultural Resources Recorded
1993	Class III	Twin Buttes Guzzler	10	1
1994	Class III	U.S. West Communications Pocatello-Arco Fiber optic line Right-of-Way	30	0
1995	Class III	Atomic City Power line Right-of-Way	106	0
2000	Class III	Cedar Butte Emergency Fire Rehabilitation Area, Fire No. F656 in Bingham County	265	2
2001	Class III	Big Desert 2000 Emergency Fire Plan for Flat Top, Coffee Point North, and Tin Cup Wildfires	70	4
2012	Class III	Table Butte Sagebrush Planting	23	1
2012	Class III	A Cultural Resources Inventory of the Big Desert Roads Fuel Break Project	14	0
2013	Class III	Big Desert Forage Reserve Fence and Pipeline	154	8
Total			672	16

Table 9: Previous Cultural Resource Inventories within the Area of Potential Effect (APE) for Hand Planting, Native Seeding, and Chemical Treatments.

Year	Class of Inventory	Cultural Resource Inventory Report Title	Acres Inventoried	Cultural Resources Recorded
1992	Class III	Buck Springs Livestock Well	3	0
1995	Class III	Table Butte Roto-mow and Seeding	110	0
1995	Class III	Mesa Roto-mow	35	0
2001	Class III	Big Desert 2000 Emergency Fire Plan for Flat Top, Coffee Point North, and Tin Cup Wildfires	2,238	53
2005	Class III	Eastside Sheep Trail Fuels Management	760	9
2006	Class III	Round Butte Fire Rehabilitation Plan	4,630	15
2006	Class III	Stage Road Fuels Management Project	6,075	9
2007	Class III	Four Small Fuels Management Projects (Crooked Crab, Heise-Elkhorn, Hell's Half Acre, and Moose)	182	1
2007	Class III	Round Butte Fire Rehabilitation Plan – Seeding	3,880	14
2012	Class III	A Class III Cultural Resources Inventory for Jefferson Fire (FK7J) ESR Project Area	385	10
2012	Class III	Table Butte Sagebrush Planting	51	1
Total			18,349	112

These cultural resource inventories were initiated for Fuels and Emergency Stabilization and Rehabilitation (ESR) projects as well as other activities that require Section 106 review as required by the National Historic Preservation Act (NHPA). As a result Class I literature review, 128 cultural resources have been identified within the APE. Of the 128 cultural resources, 65 are isolated find (prehistoric and historic), 52 are prehistoric sites, nine are historic sites, and two are sites with both historic and prehistoric components.

A *historic property* refers to cultural resources that are listed, or eligible for listing on the National Register of Historic Places (NRHP). Of the 128 cultural resources recorded within the APE, 52 are recommended eligible for listing on the NRHP. Recommendations for eligibility were sent to the Idaho State Historic Preservation Office (SHPO) along with the reports documenting the inventories. Responses from SHPO regarding the eligibility of the 128 cultural resources documented were noted for this analysis. Any cultural resources with an “unevaluated” status are considered eligible until determined otherwise.

The majority of the prehistoric cultural resources within the APE are described as lithic and tool scatters, which represent the mobile hunter gatherer lifestyle practiced by aboriginal inhabitants

of the area. Several of the lithic scatters contain formal tools and diagnostic projectile points that span from the middle Holocene (4,000 years before present [BP]) to the end of the late Prehistoric period (150 BP). Various activities are represented at these sites: tool manufacturing, short-term field camps, gathering and hunting, and food processing. A total of 48 of the prehistoric sites have the potential for intact buried deposits that could lead to a better understanding of local and regional prehistory and have been recommended as potentially eligible under Criterion D for inclusion to the NRHP.

The historic sites within the APE are mainly represented by trash and debris scatters. The historic trash and debris scatters recorded within the APE lack sufficient spatial and temporal context, and are not likely to contain intact buried deposits. As such, these sites are also recommended not eligible for inclusion on the NRHP. However, two of the historic sites (a homestead site, and railroad grade) are recommended as eligible for inclusion on the NRHP.

A significant historic feature within the APE is Goodale's (Jeffrey's) Cutoff of the Oregon Trail and is adjacent to and bisects the Sagebrush Steppe Restoration APE. The route was established by Indian peoples using the Snake River, Big Desert, the Lost Rivers, and camas meadows in their seasonal travel. Fur trappers and explorers also utilized these routes when they entered Idaho in the early 19th century. Tim Goodale promoted the use of the trail as a northern alternative to the Oregon Trail. This alternate route bypasses the rough country and challenging river crossings of the main route along the Snake River to the south. Goodale led a party of immigrants along the trail in 1862 and his name later became commonly associated with this route. Goodale's Cutoff is eligible for inclusion to the NRHP under Criteria A, B, and D.

The multicomponent sites include features and artifacts which are both prehistoric and historic in nature. One of these sites has a primarily prehistoric component and is recommended eligible for inclusion to the NRHP for information potential under Criterion D; however, the other site which is primarily historic debris is not eligible for inclusion to the NHRP due to the lack of spatial and temporal context to associate the component with significant person(s), events, or special design features.

A total of 65 isolated finds have been recorded within the APE. These include prehistoric cultural resources and include: debitage, tools, and projectile points. Temporally diagnostic tools recorded as isolates are consistent with the varieties identified within the prehistoric sites, and span from the middle Holocene to the late Prehistoric period. The isolated finds are not considered eligible for inclusion to the NRHP due to their lack of: association with significant person(s) or events, special design features, and information potential beyond the initial recording.

Environmental Consequences

Alternative A (Proposed Action)

The solitary sagebrush hand planting treatments proposed within Alternative A on approximately 22,850 acres are not likely to have direct impacts to cultural resources in low cultural resource potential areas. Within the APE identified for vegetation treatments including only hand planting, approximately 3% (672 acres) has been inventoried for cultural resources. Using the Upper Snake Field Office Area Cultural Resource Predictive Model created for analysis purposes in the Draft Resource Management Plan, there are approximately 4,570 acres of high to very high cultural resource potential in these areas. This accounts for approximately 20% of the acres proposed for hand planting.

However, establishing vegetation in areas that have been affected by wildfires in the past would indirectly impact cultural resources by stabilizing the soils and decreasing the risk of erosion. Erosion can cause the movement of artifacts from their horizontal or vertical context. Furthermore, vegetation cover can decrease the risk of vandalism and unauthorized collection of cultural resources by decreasing the visibility of sites. These types of impacts can alter resource integrity and the eligibility status of historic properties.

The treatments proposed in Alternative A could have direct impacts to cultural resources through the use of mechanical equipment and chemical treatments.

Mechanical treatments have the potential to directly affect cultural resources by physically disturbing sites, features, contexts, and artifacts and/or by breaking artifacts or destroying features. Other impacts include the possible altering or destroying historic trails and roads. The use of mechanical equipment can impact artifacts or features directly through breaking, crushing, or compacting. Indirect impacts can include the loss of vegetation and soil that could increase the rate of erosion which can cause the movement of artifacts from their horizontal or vertical context. These types of impacts can alter resource integrity and the eligibility status of historic properties.

Chemical treatments have the potential to introduce corrosive effects to some types of artifacts and features. Chemical treatments can change the soil chemistry of cultural resource sites in ways that may reduce their potential to address certain research questions and provide certain types of data. Chemicals also have a potential to contaminate plants and animals important for traditional use.

A Class III inventory of those treatment units (47,470 acres) where ground disturbing activities would occur and have not been previously inventoried and the 4,570 acres of high to very high

cultural resource potential in areas identified for hand planting would be completed prior to the implementation of activities that may have an effect on cultural resources. Approximately 39% (18,349 acres) have been previously inventoried at a Class III level, which meets current standards. Previously recorded sites located within the project areas that have not been revisited within the last 5 years would be reevaluated. This is pursuant to the 2014 State Protocol Agreement between the BLM and Idaho SHPO.

To further reduce impacts to cultural resources, “**Design Features**” have been built into each of the alternatives which states: “A Class III inventory would be completed prior to the implementation of activities that may have an effect on cultural resources. All eligible or potentially eligible archaeological sites would be flagged (or spatially identified) prior to any ground-disturbing activities to avoid adverse effects. Sites that are located in areas proposed for treatment would be avoided.” Therefore, if there are historic properties located within areas of proposed treatment, they would be avoided. With the project design features in place, implementation of the proposed action would have no effect on the integrity of historic properties.

Alternative B (Native/Non-native Seeding)

Impacts under Alternative B would be the same as those discussed under Alternative A for the mechanical treatment impacts to cultural resources.

Alternative C (No Action Alternative)

No potential ground disturbance associated with the proposed vegetation treatment would occur; therefore, having no direct impact on historic properties within the APE. However, cheatgrass would continue to dominate approximately 25,440 acres of the project area leading to the reoccurrence of wildfire and the further reduction of and diversity within the adjacent native sagebrush steppe habitats. Wildfires could make cultural resources vulnerable to disturbances associated with emergency fire suppression activities (e.g. fire lines, bulldozers). Furthermore, large, severe wildland fires and the associated loss of ecosystem components can cause detrimental impacts on cultural resources.

Several potential indirect effects on cultural resources related to large, severe fires include: (1) sites can be physically damaged by heat; (2) sites can be damaged or buried by fire suppression activities; and (3) sites can be exposed by removal of vegetation, making them more obvious to agency resource specialists or the general public.

Impacts of wildland fire to cultural resources can vary depending on the temperature and duration of the fire, and the type of cultural material exposed (Buenger 2003, Duke et al. 2003,

Deal 2002, Loyd et al. 2002, Shackley et al. 2002, Solomon 2002, Wintroppe 2004). Generally, higher temperatures or longer duration of exposure increases the potential for damage to cultural resources. Organic and inorganic materials are affected differently by heat and fire. Organic materials such as (e.g. wood, bone, etc.) are more at risk because they tend to burn or be altered at lower temperatures than inorganic items. Inorganic materials (e.g. lithics, ceramics, cans, glass) can be impacted through fracturing, shattering, and changes in color which can reduce an artifacts' ability to render information about the past.

Impacts to cultural resources from fire suppression activities can result in the inadvertent disturbance of known or unknown cultural resources through destruction or alteration of spatial relationships of features and artifacts. Suppression efforts such as hand lines, bulldozer lines, and fire camps can disturb the ground and impact cultural resources. Water, foam detergents, fire retardants can damage artifacts and features by causing swelling and contraction. The use of retardants can cause rapid cooling that can result in breakage, spalling, corrosion, staining, rusting, discoloration, and warping.

Wildfire can also damage or eliminate vegetation cover at cultural resource locations, which could lead to increased soil erosion, thus reducing cultural resource stability. Furthermore, exposure of cultural resources to the general public may increase unauthorized collection or vandalism.

Economic and Social Values

Affected Environment

Two measures of economic impacts used in studies exploring impacts to livestock operations due to changes in federal grazing permits and leases, are herd reduction and forage substitution (Rowe and Bartlett, 2001). Herd reduction may be a better indicator of operation efficiency rather than direct economic impact at the level of the individual operator (Rowe and Bartlett, 2001). The impact on any single ranch operation of a reduction in public land AUMs may be enormous, depending on the flexibility of its nonfederal forage base and other factors (Harp et al, 2000). The impacts of herd reductions resulting from federal land management policy changes that reduce federal land AUMs have been estimated at the community and county level (Harp et al, 2000), however, these estimates are based on evenly distributed federal land AUM reductions at a scale beyond the allotment level. Based on recent USDA cattle market reports (USDA, 2013) the average recent market steer (800lbs) price was \$1,000 or \$100 per AUM assuming a 10 AUM input. The average recent market price for replacement cows was \$1,400 or \$116 per AUM assuming 12 AUMs input. Therefore the change in gross revenue for the operators may range from \$100 to \$116 per AUM. Forage replacement has also been used as a proxy indicator

of economic impact. Forage replacement values may range in cost from replacement from private pasture to replacement from hay versus the annual cost of forage on public land which was \$1.35 per AUM in 2014. Average private pasture cost in Idaho in 2014 was \$15.50/AUM and average local hay prices were \$85/AUM. Therefore the forage substitution cost annually would range from \$14.15 to \$83.65 per AUM.

Environmental Consequences

Alternative A (Proposed Action)

Alternative A would result in the temporary suspension of Active AUM's within the Twin Buttes, West Cedar Butte, North Butte, Camas Butte, Mesa, Valley, Buck Springs, Hells Half Acre and Stage Road Allotments compared to current levels. The AUM loss would be split to varying degrees between the existing permittees within each allotment during the time of implementation. As previously noted, seeding treatments conducted within the Big Desert Sheep and Twin Buttes Allotments would not result in the temporary suspension of AUM's, rather sheep operators would be required to herd animals away from seeded areas. As a result, these two allotments were not included in this impact analysis.

The temporary decrease would be a short-term financial detriment to the operators as it results in an AUM decrease for each operator. In this case, an estimate of revenue loss and forage replacement cost is figured. In this situation there would be a forage replacement cost and potential revenue would decrease. Forage replacement values and potential revenue decreases during the temporary closure, assuming the \$14.15 to \$83.65/AUM rate for forage replacement and \$100-\$116/AUM rate for revenue decrease, are identified in Table 10. Adjustments to livestock numbers and turnout may occur on a yearly basis, but these adjustments would not affect AUM numbers below those proposed under this alternative. While these impacts may look substantial, the long-term benefits of improved forage and quantity for both domestic livestock and wildlife and improved ecological function far exceeds the short-term impacts to the permittee.

Table 10: Forage Replacement Values and Potential Revenue Decreases During the Temporary Closure.

Allotment	Acres Treated	AUM Reduction	Avg. Forage Replacement Cost/AUM		Forage Replacement		Avg. Revenue Decrease/AUM		Revenue Decrease	
			Low	High	Low	High	Low	High	Low	High
West Cedar Butte	386	70	\$14.15	\$83.65	\$993.07	\$5,870.71	\$100.00	\$116.00	\$7,018.18	\$8,141.09
North Butte	378	29	\$14.15	\$83.65	\$411.44	\$2,432.28	\$100.00	\$116.00	\$2,907.69	\$3,372.92
Camas Butte	1854	244	\$14.15	\$83.65	\$3,451.86	\$20,406.20	\$100.00	\$116.00	\$24,394.74	\$28,297.89
Mesa	506	63	\$14.15	\$83.65	\$894.99	\$5,290.86	\$100.00	\$116.00	\$6,325.00	\$7,337.00
Valley	552	100	\$14.15	\$83.65	\$1,420.15	\$8,395.42	\$100.00	\$116.00	\$10,036.36	\$11,642.18
Buck Springs	1548	206	\$14.15	\$83.65	\$2,920.56	\$17,265.36	\$100.00	\$116.00	\$20,640.00	\$23,942.40
Hells Half Acre	182	14	\$14.15	\$83.65	\$204.39	\$1,208.28	\$100.00	\$116.00	\$1,444.44	\$1,675.56
Stage Road	24493	1042	\$14.15	\$83.65	\$14,747.91	\$87,184.66	\$100.00	\$116.00	\$104,225.53	\$120,901.62

Alternative B (Native/Non-native Seeding)

Impacts under Alternative B would be the same as those discussed under Alternative A.

Alternative C (No Action Alternative)

Alternative C would result in no treatment implementation and no temporary changes in livestock grazing within the allotments. As a result, the quantity and quality of the habitat and vegetation would not change and, over-time, may lead to declines in the productivity and habitat value of the existing vegetation.

Invasive, Non-native Species

Affected Environment

Invasive plants infest land and deplete water resources which cause environmental and economic damage. In sagebrush steppe ecosystems, invasive plants often disrupt the succession of native species. Many invasive plants have been introduced into the project area primarily by seeds dispersed by vehicles, humans, livestock, wind, and wildlife and can quickly become established in highly disturbed areas. Plant communities within the proposed project area have been subjected to a variety of disturbances such as roads, recreation use, livestock grazing, and the installation of range improvement projects such as fences.

Several noxious weed species, Canada thistle (*Cirsium arvense*), Russian knapweed (*Acroptilon repens*), musk thistle (*Carduus nutans*), leafy spurge (*Euphorbia esula*), black henbane (*Hyoscyamus niger*), Scotch thistle (*Onopordum acanthium*), spotted knapweed (*Centaurea maculosa*) and rush skeletonweed (*Chondrilla juncea*), were identified and treated adjacent to or within close proximity of the project area. Infestation size for each of the species treated was estimated to be less than ten plants. Additionally, cheatgrass (*Bromus tectorum* L.) is currently a minor component of the vegetative community in most of the project area with the exception of the Stage Road treatment unit where it is either codominant or dominant to the remaining native vegetation (Table 11). However, disturbances such as livestock grazing, recreation activities and wildfire could lead to the conditions necessary for its future spread within the area.

Table 11: Invasive, Non-native Species within the Sagebrush Steppe Restoration Project Area.

Common Name	Scientific Name	Characteristics	Acres Infested (approx.)
Cheatgrass	<i>Bromus tectorum</i>	Invasive annual grass native to the Mediterranean area. Out-competes desirable vegetation due to its early growth habits.	Isolated patches throughout much of the project area, acreage unknown. Dominant within the Stage Road unit.
Canada thistle	<i>Cirsium arvense</i>	Rhizomatous perennial forb native to southern Eurasia. Aggressively infesting riparian and highly disturbed areas.	Isolated patches throughout the project area (80 ac.)
Russian knapweed	<i>Acroptilon repens</i>	Rhizomatous perennial forb native to Eurasia. Forms dense colonies in pastures and along roadsides.	Isolated patches throughout the project area (34 ac.)
Rush skeletonweed	<i>Chondrilla juncea</i>	Perennial or biennial forb native to southern Europe. Disperses long distances (1-5 mi.) and can invade a variety of habitats.	Isolated patches throughout the project area with high concentrations within the southern portion of the Stage Road unit (1,051 ac.)
Musk thistle	<i>Carduus nutans</i>	Biannual native to southern Europe. Rapid spread in pasture, roadside and waste areas.	Isolated patches throughout the project area (144 ac.)
Leafy spurge	<i>Euphorbia esula</i>	Rhizomatous perennial native to Eurasia. Toxic to cattle and humans.	Isolated patches throughout the project area (92 ac.)
Black henbane	<i>Hyoscyamus niger</i>	Annual or biannual native to Europe. Common along roadsides and waste areas. Toxic to livestock, though not commonly grazed by animals.	Isolated patches throughout the project area (1 ac.)
Scotch thistle	<i>Onopordum acanthium</i>	Biannual native to Europe. Found along roadsides and waste areas with seed viability of 30-50 years.	Isolated patches throughout the project area (3 ac.)
Spotted knapweed	<i>Centaurea maculosa</i>	Biannual or short-lived perennial native to Eurasia. Wide-spread in any disturbed soil type and releases chemicals inhibiting surrounding vegetation growth.	Isolated patches throughout the project area (3 ac.)

Integrated invasive plant management has been conducted for the last several years as part of an aggressive weed control program by both the BLM and cooperating counties. Weed control focuses on eradicating new invaders followed by containing wide-spread or established infestations.

Environmental Consequences

Alternative A (Proposed Action)

Ground disturbance, brought on by the drill seeding treatments, would increase the short-term potential for the introduction and spread of invasive plants on 47,470 acres proposed for treatment. This potential would be reduced in subsequent years as the seeded herbaceous species become established and start expanding, providing resistance to invasive plant invasion. As funding allows, treatment areas would be monitored for the presence of noxious weed species and if found would be eradicated (see ***Design Features***). While monitoring and treatments would reduce the potential for the spread of noxious weeds, funding levels may not allow the complete eradication of weeds across all of the treatment units.

There is potential for the introduction of new invasive plants into the area by contaminated equipment or by the seed mixes that contain weed seeds. Design features of the Proposed Action such as cleaning vegetation from equipment prior to ground-disturbing activity and ensuring the seed mixes are certified weed-free would minimize this potential.

Despite the short-term risk of new weed infestations, the long-term effect of implementing this alternative would be an overall reduction in invasive plant introduction and spread by reducing disturbance associated with uncharacteristic wildfires and allowing native herbaceous vegetation to repopulate the project area, resulting in a more weed resistant plant community.

Alternative B (Native/Non-native Seeding)

Impacts under Alternative B would be the same as those discussed under Alternative A.

Alternative C (No Action Alternative)

Disturbances associated with treatment activities would not occur which would reduce the short-term potential for new weed infestations. However, the potential of uncharacteristic wildfire and the further reduction of native herbaceous species that would otherwise inhibit invasive species/noxious weed establishment would continue to be a concern due to the uncontrolled expansion of annual grasses into the sagebrush steppe. This would lead to further disturbances

and long-term degradation of ecosystems prone to invasive plant establishment across the project area.

Range Resources

Affected Environment

The Sagebrush Steppe Restoration project area includes public lands within 11 grazing allotments including Big Desert Sheep (#07000), Buck Springs (#06039), Camas Butte (#06033), Deadman (#01006), Hells Half Acre (#03005), Mesa (#06043), North Butte (#06031), Stage Road (#07010), Twin Buttes (#13000), Valley (#06036) and West Cedar Butte (#06034). Table 12 describes the specific livestock grazing information pertaining to each of the allotments.

Table 12. Allotment Grazing Information

Allotment	Landmass	Grazing Authorizations	Livestock	Active AUMs	Season(s) of Use
Big Desert Sheep	236,990	17	Sheep	29,173	4/1-6/15 10/1-1/31
Buck Springs	2,745	1	Cattle	368	6/1-10/14
Camas Butte	25,800	2	Cattle/Sheep	3,388	4/15-6/30 10/1-1/15
Deadman	58,475	4	Cattle/Sheep	2,430	4/1-12/15
Hells Half Acre	355	1	Cattle	28	5/1-5/28
Mesa	2,250	1	Cattle	280	5/8-6/8 11/1-11/30
North Butte	5,585	1	Cattle	428	5/1-6/14 10/1-11/28
Stage Road	24,490	2	Cattle	1,040	4/16-6/5 10/1-12/10
Twin Buttes	319,470	8	Sheep	14,342	4/1-6/30 11/15-2/28
Valley	6,010	1	Cattle	1,083	4/10-9/30
West Cedar Butte	2,730	1	Cattle	500	5/1-6/1 11/1-11/29

The Proposed Action and Alternative, would directly impact a portion of each of the previously mentioned allotments (Appendix A, Map 6).

Environmental Consequences

Alternative A (Proposed Action)

Section 4.9 of the FMDA EIS discloses impacts to range resources resulting from the proposed treatment activities. These impacts generally result in a temporary loss of AUMs while

treatment activities are being conducted. Areas identified for mechanical and chemical treatments would not adversely impact range resources. Actions associated with these types of treatments (i.e., herbaceous seeding, chemical spraying) would likely increase preferred forb and grass species within those areas due to the removal of cheatgrass.

Areas treated for the sole purpose of increasing sagebrush through the hand planting of seedlings would not be temporarily closed to livestock grazing due to the types of treatments being employed and due to the presence of an intact native understory. While temporary short-term impacts are likely to cause some minor inconveniences these impacts would be short-term. A successful project could also provide long-term benefits to the operator. Completion of the project would aid to increase the existing diversity and productivity of the site, which would directly benefit livestock grazing in the allotment and benefit the longevity of the operation. As a result, the overall impacts to the permittee within these allotments would be negligible and not result in any temporary reduction in AUMs or loss of available forage.

Seeding treatments designed to improve the native herbaceous plant component in the treatment area would have both short and long term impacts on range resources. Seeded areas would be temporarily closed to livestock grazing to allow for establishment of the seeded species. Treatment areas may be unavailable for several years until the treatment objectives are met. Operators would be issued site specific temporary closure decisions as applicable. Livestock numbers and/or season of use would be reduced which would require additional planning by the affected operators to address the short-term reduction. Following establishment of the seeding, the improved quality and abundance of herbaceous species would have long-term impacts on range resources. Healthy plant communities have improved elastic response to short-term drought conditions, provide for improved soil stability, and reduce opportunities for establishment of noxious weeds thereby maintaining range resources over time adding stability to the associated livestock operations.

Preceding the drill seeding treatments an array of herbicides could be used to control invasive species/noxious weeds and treat high concentrations of cheatgrass. These treatments would aim to increase the potential success of the seeding by limiting annual completion and limit the spread of noxious weeds during implementation. Impacts from the use of these chemicals on livestock grazing within the treatment areas would range from no impact to a moderate risk from acute exposure due to the consumption of the chemically treated vegetation. The risks of adverse effects to livestock are identified in Table 13 and are further described in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (DOI-BLM 2007).

Table 13: Risk of Adverse Effects to Livestock from Exposure to Herbicides Proposed for Application*.

Herbicide	Risk of Adverse Effects to Livestock
2,4-D	Moderate risk from acute exposure associated with the consumption of contaminated forage.
Chlorsulfuron	No risk under any exposure scenario.
Clopyralid	Low risk from acute exposure associated with the consumption of contaminated forage.
Dicamba	No to low risk under both chronic and acute exposure scenarios.
Glyphosate	Low to moderate risk from acute exposure associated with the consumption of contaminated forage. No to low risk from chronic exposure.
Metsulfuron methyl	Low risk from acute exposure associated with the consumption of contaminated forage. No risk under chronic exposure scenarios.
Picloram	Low to moderate risk from acute exposure associated with the consumption of contaminated forage. No risk associated with chronic exposure.
Tebuthiuron	Low risk from both acute and chronic exposure scenarios.
Triclopyr	Low to moderate risk from both acute and chronic exposure associated with the consumption of contaminated forage.
Imazapic	Low risk from acute exposure. No risk from chronic exposure scenarios.

* Data compiled from (DOI-BLM 2007: 4-127, 4-131).

Alternative B (Native/Non-native Seeding)

Impacts under Alternative B would be the same as those discussed under Alternative A.

Alternative C (No Action Alternative)

Under the No Action alternative, no treatments would be performed and existing grazing uses would not be affected in the short-term. However, desirable livestock forage could potentially decline over time due to the increasing threat of uncharacteristic wildfire and the continued expansion of cheatgrass and subsequent loss of desirable understory vegetation.

Soils

Affected Environment

Soils within the USFO Sagebrush Steppe Restoration project area reflect the geologic history, topography, and climate that is unique to the different treatment areas. Soils within the project area have been mapped and are described by the Soil Survey of Butte County Area, Idaho, Parts

of Butte and Bingham Counties (USDA-NRCS 2009), Bonneville County Area Survey (USDA-NRCS 2008b), Jefferson County Survey Area (USDA-NRCS 2008c), Bingham Area Survey (USDA-NRCS 2008a), and Power County Area Survey (USDA-NRCS 2008d). Soils within the West Cedar Butte treatment area and a majority of the soils within the Table Butte treatment area do not have a published soil survey. Information for soils in these areas has been generalized based upon topographic location, information on soils in nearby areas, and historic observations.

Soils within the project area are generally moderately deep however bedrock may appear at the surface (as seen at rock outcrops) or soils may be deeper than 60 inches. Soils within the project area are generally derived from eolian deposits, loess, mixed alluvium, and/or lacustrine deposits over bedrock derived from basalt. The topography of most of the areas is undulating or rolling, though there are areas with moderately steep hillsides. Soils are generally deep (greater than 40 in. to bedrock) on nearly level to rolling terrain (0–16% slope angle). On undulating to hilly uplands (1–30% slope), slightly altered bedrock is often more than 40 in. below the surface. On steep and very steep slopes (20–60% slope), soils range from shallow (10–20 in.) to moderately deep (20–40 in.) over partially weathered bedrock. Rock outcrops are common on steeper slopes and gently sloping basalt lava flows with little or no soil development.

Soil properties such as electrical conductivity (EC), sodium absorption ratio (SAR), and pH can be used to identify saline and saline sodic soils. Saline and saline sodic soils can cause water stress to plants and may reduce the survivability of hand planted sagebrush or drill seeded native plants, particularly in periods of drought when plant available water is already limited. Based upon the EC, SAR, and pH values of the whole soil reported by the NRCS it was determined that the Table Legs Butte (475 acres saline-sodic, 4,391 acres saline), Twin Buttes (309 acres saline-sodic, 1,501 acres saline; there may be more saline or saline sodic soils within the treatment area that have not been mapped yet), Hell's Half Acre (182 acres saline), and Stage Road (10,936 acres saline-sodic, 2,675 acres saline) treatment areas include soils that fit the criteria for saline or saline-sodic soils.

The NRCS has also identified soils which are susceptible to wind erosion using wind erodibility groups (WEG). WEGs are groups of soils with similar properties that affect the susceptibility of cultivated soils to wind erosion. However, WEGs provide an indication of which rangeland soils may be vulnerable to wind erosion following surface disturbing activities; groups 1 and 2 are considered by the USFO to be vulnerable to wind erosion. Based upon NRCS WEGs Camas Butte (267 acres), Jefferson Fire (528 acres), and Mesa (995 acres) treatment units contain soils vulnerable to wind erosion.

Environmental Consequences

Alternative A (Proposed Action)

Under the proposed action hand planting of sagebrush seedlings would occur within all treatment units; drill seeding and chemical treatments would occur within the Jefferson Fire, West Cedar Butte, Camas Butte, Mesa, Hell's Half Acre, and Stage Road treatment units.

Sagebrush Hand Planting

Hand planting sagebrush seedlings generally results in minor disturbances to the soil. The location at which the holes for sagebrush seedlings are drilled would be disturbed through the use of an earth auger, hoedad, or planting bar. Erosion of disturbed soil will be minimized by the compaction of loose soil around the base of the sagebrush seedling. Drilled holes may vary in size but will generally be 3 inches in diameter.

Additional disturbances are expected to occur due to activities supporting the hand planting. These disturbances are expected to be primarily in the form of minor compaction or disturbance of the soil surface from vehicles or ATVs used to transport planting tools and materials.

Drill Seeding

The use of drill seeding or aerial seeding followed by harrowing would disturb the soil surface and increase the risk of erosion. The soils within the Camas Butte, Jefferson Fire, and Mesa treatment areas that are wind erosive would be particularly vulnerable to soil loss until vegetation becomes established. Erosion reduces that amount of organic matter within the soil; organic matter is important for aggregate stability, nutrient cycling, and water retention. Erosion rates of disturbed soils should return to natural rates once the seeded vegetation has become established.

Chemical Treatments

Chemical application would be authorized within the Stage Road treatment area for the purpose of treating cheatgrass. Impacts to soil resources from the application of chemicals for the control of invasive, non-native species on BLM land have been assessed in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (DOI-BLM 2007). Table 14 summarizes the persistence of each chemical within the soil and any potential impacts that may occur. Note, the pH of soils within the project area range from 6.7-8.8, based upon NRCS soil survey data (USDA-NRCS 2008 a-d and 2009), and are considered to be neutral to strongly alkaline.

Impacts of *Pseudomonas fluorescens* strain D7 bacterium were not included in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (DOI-BLM 2007) and would only be applied over 50 acre areas as test cases. The impacts of the bacteria on soil microbial communities are unknown.

Additional impacts from activities associated with the chemical treatment of cheatgrass may also occur, primarily in the form of surface disturbance from vehicle and/or ATV use. Minor compaction and erosion may occur from these disturbances however these impacts are expected to be transient.

Table 14: Summary of the Persistence and Impacts of Chemicals Proposed for Application within the Sagebrush Steppe Project Area on the Soil Resource.

Herbicide	Soil Half-life (days)*	Impacts of Herbicide**
2,4-D	10	<ul style="list-style-type: none"> • Rapidly inactivated in moist soil • In alkaline soils it is rapidly converted to a form that can be photo- and biodegraded and that does not readily adsorb to soil • In acidic soils it resists degradation • Typical application rates do not effect macro-organisms and would probably not have a serious negative effect on most soil microorganisms
Chlorsulfuron	40	<ul style="list-style-type: none"> • Remains relatively stable in neutral soils • Remains active in soils for more than 1 year after application, especially at low temperatures and high pH • Only mildly toxic to terrestrial microorganisms, and effects are generally transient
Clopyralid	40	<ul style="list-style-type: none"> • Unstable in soil • Does not bind tightly to soil and can leach under favorable conditions • Rapidly biodegrades in soil
Dicamba	14	<ul style="list-style-type: none"> • Is not adsorbed by most soils and is highly mobile, however what does adsorb is moderately persistent • The primary breakdown product is 3,6-dichlorosalicylic acid which adsorbs to soil strongly, however this is little information on the toxicity of this breakdown product.
Glyphosate	47	<ul style="list-style-type: none"> • Inactivated by soil adsorption • Water soluble but has a high affinity to bind to soil particles • Adsorption increases with clay content and cation exchange capacity and decreases with pH and phosphorous content • There is little information to suggest that the chemical is harmful to soil microorganisms under field conditions
Metsulfuron methyl	30	<ul style="list-style-type: none"> • Degradation occurs through hydrolysis and microbial degradation • In acidic soils adsorption is influenced by soil temperature, clay content, and organic matter content • In alkaline soils adsorption is very low and leaching can be high
Picloram	90	<ul style="list-style-type: none"> • Adsorbs to clay particles and organic matter • If clay content and organic matter are low it can move easily with water • Can remain active in soil at levels toxic to plants for more than 1 year at typical application rates • Half-life can be up to 4 years in arid environments

Herbicide	Soil Half-life (days)*	Impacts of Herbicide**
		<ul style="list-style-type: none"> • Dissipates most slowly when soils are alkaline, fine textured, and low in organic matter • At high application rates microbial activity may be inhibited
Tebuthiuron	360	<ul style="list-style-type: none"> • In soil this chemical is resistant to abiotic degradation and biodegradation • Has a low adsorption affinity to soil, though this increases with organic matter and clay content • It is mobile in soil and has been detected in groundwater
Triclopyr	46	<ul style="list-style-type: none"> • Microbial metabolism accounts for a large portion of degradation in soil • Warm moist soils with high organic matter will support the highest rates of herbicide metabolism
Imazapic	120-140	<ul style="list-style-type: none"> • Is moderately persistent in soils and has not been found to move laterally with surface water • Sorption to soil increases with decreasing pH and increasing organic matter and clay • Runoff would be negligible in relatively arid environments as well as areas with sandy or loam soils

* - Adapted from Vogue et al. 1994

** - Information summarized from the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (DOI-BLM 2007)*. References for specific information summarized can be found in this document.

Over the long-term, the hand planting of sagebrush seedlings and seeding of native grasses and forbs would help ensure the long-term stability of the soils within the treatment areas. Additionally, successful treatment of cheatgrass within the Stage Road treatment area would help reduce the occurrence of frequent wildland fire and repeated removal of surface vegetation that protects the soil surface.

Alternative B (Native/Non-native Seeding)

Impacts under Alternative B would be the similar to those discussed under Alternative A. Impacts discussed under Alternative A would only apply to the Stage Road treatment area. Soils within the Deadman Native, Fred Butte, Table Butte, Table Legs Butte, Twin Buttes, Camas Butte, Hell's Half Acre, Jefferson Fire, and Mesa treatment areas would not experience disturbances associated with the hand planting of sagebrush seedlings or drill seeding. Conditions within these treatment areas are expected to remain static; areas that are degrading are expected to continue to degrade and areas that are stable are expected to remain stable.

Alternative C (No Action Alternative)

Under the No Action Alternative mechanical drill seeding and hand plantings would not occur. Soils within all the treatment areas would not experience the disturbances associated with the planting or seeding activities. Conditions within these treatment areas are expected to remain static; areas that are degrading are expected to continue to degrade and areas that are stable are

expected to remain stable. Within the Stage Road treatment area cheatgrass may continue to expand, increasing litter loads and increasing the occurrence of frequent fires within the area.

Tribal Treaty Rights and Interests

Affected Environment

The 1868 Fort Bridger Treaty, between the United States and the Shoshone and Bannock Tribes, reserves the Tribes' right to hunt, fish, gather, and exercise other traditional uses and practices on unoccupied federal lands.

The federal government has a unique trust relationship with federally-recognized American Indian Tribes including the Shoshone-Bannock Tribes. BLM has a responsibility and obligation to consider and consult on potential effects to natural resources related to the Tribes' treaty rights or cultural use. Amongst the resources or issues of interest to the Tribes that could have a bearing on their traditional use and/or treaty rights include access to and availability of traditional use plant and animal species.

Environmental Consequences

Alternative A (Proposed Action)

Under the Proposed Action, there would be no changes in land status or access and treatment areas would retain their unoccupied Federal land status. Therefore, the Shoshone Bannock Tribe's right to access the lands to exercise treaty rights and traditional uses would be unaffected.

The Proposed Action would, however, result in both adverse and beneficial impacts to some of the natural resources that the Tribes may require to exercise their treaty rights. Minor, short-term adverse impacts would be associated with treatment of species that may be used for traditional purposes. The impacts include the modification of wildlife habitat and changes in species diversity. In addition, wildlife species relied on by the Tribes for subsistence would be temporally displaced during treatment activities.

Over the long-term, however, the quantity and diversity of vegetative species used by the Tribes would be enhanced due to a reduction in the density of cheatgrass and increase in the native herbaceous vegetation and shrub component. Additionally, the potential size and severity of wildfires would be reduced which, in turn, would encourage increased use of the area by wildlife species hunted by the Tribes.

Alternative B (Native/Non-native Seeding)

Under Alternative B, impacts would be similar to Alternative A with the exception that a native/non-native seed mix would be used within the 25,440 acres that make up the Stage Road treatment unit. The use of non-natives within the seed mix would increase the likelihood of the seeded species outcompeting the established cheatgrass and allowing for the reestablishment of deep-rooted perennial bunchgrasses into the site. Over the long-term, the quantity and diversity of vegetative species used by the Tribes would be enhanced due to a reduction in the density of cheatgrass and increase in the herbaceous vegetation and shrub component. As in the preferred alternative, the seeding, once established, would reduce the potential size and severity of wildfires due to the reduction of cheatgrass which is the leading cause in the shortening of the fire return intervals.

Alternative C (No Action Alternative)

Under the No Action alternative, cheatgrass would continue to be the dominant vegetation within the Stage Road treatment unit while many of the remaining treatment units would remain void of herbaceous vegetation and sagebrush until natural regeneration of the sites were to occur. Additionally, uncharacteristic wildfires would continue to be a threat within the project area, especially within the Stage Road unit, which would lead to further deterioration of the native plant communities and sagebrush steppe habitat adjacent to the project area. This would continue to decrease the diversity of plant materials available for tribal uses and discourage use of this habitat by wildlife species customarily hunted by the Tribes.

Vegetation

Affected Environment

The proposed project area encompasses approximately 70,320 acres managed by the BLM. Treatments would target those areas within the USFO that have not adequately recovered from past disturbances, including historic grazing practices, homesteading impacts and wildfires. The vegetation community of all proposed treatment areas may best be described at the broad scale as inter-mountain basin big sagebrush steppe plant community, as previously discussed. This plant community is visually characterized by two species of big sagebrush. Basin big sagebrush (*Artemisia tridentata tridentata*) occurs on deep and well-drained sandy soils, at a wide range of elevations in the 10 to 20-inch average annual precipitation zone. Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) occurs on finer-textured, shallow soils that have limited depths of water infiltration, at low- to mid-elevations and in the 8 to 12-inch precipitation zone.

Three ecological sites comprise the majority of the proposed treatment area and include: Wyoming big sagebrush/bluebunch wheatgrass (*Artemisia tridentata* spp. *wyomingensis*/*Pseudoroegneria spicata*), Wyoming big sagebrush/needle-and-thread/Indian ricegrass (*Artemisia tridentata* spp. *wyomingensis*/*Hesperostipa comata*/*Achnatherum hymenoides*) and basin big sagebrush/needle-and-thread/Indian ricegrass (*Artemisia tridentata* spp. *tridentata*/*Hesperostipa comata*/*Achnatherum hymenoides*). Healthy and productive vegetative areas within these ecological sites include diversity in all life forms (shrubs, grasses, and forbs). NRCS ecological site descriptions provide a description of Historic Climax Plant Communities (HCPC) with a range of composition by weight of each species provided. For each life form, the dominant species is the most abundant by weight for the site. Within the Wyoming big sagebrush/bluebunch wheatgrass ecological site, Wyoming big sagebrush is the dominant shrub species, and bluebunch wheatgrass is the dominant grass species. Other native species contributing to the total annual biomass include Thurber's needlegrass (*Achnatherum thurberianum*), Sandberg's bluegrass (*Poa secunda*), tapertip hawksbeard (*Crepis acuminata*) and arrowleaf balsamroot (*Balsamorhiza sagittata*). Additional native species are commonly present and provide community diversity, though they are seldom abundant and generally minor components in regard to total annual biomass. The Wyoming big sagebrush/needle-and-thread/Indian ricegrass ecological site is dominated by Wyoming big sagebrush in the overstory and needle-and-thread and Indian ricegrass in the understory. Other species such as thickspike wheatgrass (*Elymus lanceolatus*), tapertip hawksbeard and arrowleaf balsamroot may also be present within the understory. The basin big sagebrush/needle-and-thread/Indian ricegrass ecological site is dominated by basin big sagebrush in the overstory and needle-and-thread and Indian ricegrass in the understory. Other species such as sand dropseed (*Sporobolus cryptandrus*), bottlebrush squirreltail (*Elymus elymoides*), arrowleaf balsamroot and sand scurfpea (*Psoraleidium lanceolatum*) may also be present.

Utilizing both quantitative and qualitative monitoring conducted over the last ten years by the USFO the proposed treatment units were developed as they were identified as areas substantially lacking herbaceous and/or shrub composition and cover relative to ecological site potential, and may be experiencing some degree of cheatgrass invasion. Vegetative cover within the individual treatment units is variable with native herbaceous (grasses and forbs) cover ranging between 7-23 percent, sagebrush cover between 0-17 percent, and other shrub cover (e.g. green rabbitbrush - *Chrysothamnus viscidiflorus*) between 2-20 percent. While a majority of the treatment units did display some degree of annual grass (cheatgrass) cover between 0-14 percent, only a few of the units possessed monitoring data pertaining to cheatgrass density. Within those units, cheatgrass densities ranged between 2 and 204 stems/ft² (65,340 – 8,890,596 stems/ac). Tables 15 and 16 summarize the monitoring data in relation to percent vegetative cover and cheatgrass density per acre within those treatment units that makeup the project area.

Table 15: Vegetative Cover within the Sagebrush Steppe Treatment Units.

Treatment Unit	Perennial Grass Cover (%)	Annual Grass Cover (%)	Annual Forb Cover (%)	Perennial Forb Cover (%)	Sagebrush Cover (%)	Other Shrub Cover (%)
Camas Butte	21	5	5	0	1	19
Deadman Native	12	0	2	4	0	16
Fred Butte	28	0	14	0	2	6
Hells Half Acre	8.8	13.7	3.3	8.7	14.6	2.0
Jefferson	7.3	0.3	2.2	0.2	0.6	3.5
Mesa	22.5	7.8	0	1	1.7	2
Stage Road	6	7	6.3	1.5	0	3
Table Butte	21	5	5	0	1	19
Table Legs Butte	19	2	0	4	17	15
Twin Buttes	9	0	0	1	0	20
West Cedar Butte	22.5	7.8	0	1	1.7	2

Table 16: Cheatgrass Density within the Sagebrush Steppe Treatment Units.

Treatment Unit	Cheatgrass (stems per foot ²)	Cheatgrass (stems per acre)
Hells Half Acre	204.1	8,890,596
Jefferson	1.5	65,340
Stage Road	61	2,657,160

In addition to the inventory and monitoring, a subsequent FRCC analysis was conducted for the primary National Vegetation Classification System (NVCS) vegetation type present on BLM-administered public lands in the project area. FRCC is a classification of the departure from the natural fire regime and its subsequent effect on vegetation composition and structure at the landscape scale (Hann and Bunnell 2001, LANDFIRE, 2007). The three categories of FRCC include low 0-33 percent (FRCC 1), moderate 34-66 percent (FRCC 2) and high 67-100 percent (FRCC 3) departure from the central tendency of the natural fire regime (Hann and Bunnell 2001, Hardy et al. 2001, Schmidt et al. 2002).

The FRCC analysis identified that the cumulative rating for the project area, taking into consideration the departure from the natural fire regime and the resulting departure from the natural vegetation composition, structure, and pattern, was determined to be an FRCC II (Table 17). Landscapes classified as an FRCC II (34-66% departure) are defined as having moderately altered fire regimes and are moderately at risk of losing key ecosystem components. Additionally, fire frequencies may have departed by one or more return intervals (either increased or decreased), resulting in moderate changes in fire and vegetation attributes. See Appendix B for a further description of FRCC, the methodology used for the analysis conducted in the Sagebrush Steppe Restoration Project area, and detailed results.

Table 17: Natural and Current Fire Regime Condition Class by Vegetation Type.

Vegetation Type	Acres	Natural Fire Regime (1)	Current Fire Regime Condition Class
Inter-mountain basins big sagebrush steppe	70,320	IV	2
Overall FRCC Rating for the Project Area			2

Notes

- (1) Fire Regime I: 0-35 year frequency, surface severity; Fire Regime II: 0-35 year frequency, replacement severity; Fire Regime III: 35-100+ year frequency, mixed severity; Fire Regime IV: 35-100+ year frequency, replacement severity; Fire Regime V: 200+ year frequency, replacement severity.

Environmental Consequences

Alternative A (Proposed Action)

Native Herbaceous Seeding

Short-term impacts from the seeding of grasses and forbs would include the disturbance of existing plant species and soils during the drill seeding or harrowing treatments following the aerial application of seed. These actions may result in the temporary reduction of plant vigor due to the damaging of foliage and/or root systems. Additionally, the disturbed soils would provide an avenue for invasive species/noxious weeds to establish as well as increase soil movement until seeded species repopulate the site. While the noxious weed aspect would be mitigated through a post seeding noxious weed monitoring and chemical treatment strategy, the potential for increase offsite soil movement would not be remedied until perennial vegetation reestablished the site.

Long-term impacts from seeding native grasses and forbs would include the potential for increased vegetative cover and vigor in areas where native herbaceous vegetation is currently lacking. Increased native vegetation cover, specifically large perennial bunchgrasses, allows for the catchment of winter snows, reduced erosion, higher soil moistures and better competition against cheatgrass invasion. The increased availability of soil moisture for plants would likely

lead to better vigor of existing plants and allow for further establishment of the site by grasses and forbs once seeded species mature and start to produce seed.

Sagebrush Hand Planting

Short-term impacts from the planting of shrubs would include the disturbance of existing plants, generally grasses and forbs, during seedling planting. These actions may result in the temporary reduction of vigor by plants directly affected by augers, shovels, and other planting processes due to damaging of foliage and/or root systems. While the soil disturbance caused by the planting of seedlings would be relatively small, it may still provide an avenue for invasive species/noxious weeds establishment. Indirectly, the effects of these small disturbances would be offset by the increased shrub diversity and cover due to the plantings.

Long-term impacts from planting shrubs would include the potential for increased vegetative cover and vigor in areas where shrubs were historically present but are currently lacking. Once established, shrub cover would allow for increase snow capture and retention and reduce soil erosion. This increased snow pack would lead to higher soil moistures for plants later into the growing season and allow for grasses and forbs not present on the site to migrate into traditional habitat areas.

Chemical Treatments

Chemical treatments could lead to the mortality of non-target plant species due to application drift or improper application and from soil compaction related to off-road travel during chemical spot treatment operations. Additionally, there is a potential for chemical accumulation within the soils resulting in changes to soil composition over time. However, by adhering to the chemicals application label, adverse impacts due to chemical use can be mitigated and the beneficial results such as a reduction of invasive species/noxious weed species and the increased establishment and expansion of native vegetation can occur.

Alternative B (Native/Non-native Seeding)

Under Alternative B, impacts would be similar to Alternative A with the exception that a native/non-native seed mix would be used within the 25,440 acres that makeup the Stage Road treatment unit. Since 1997 the Stage Road treatment unit has been reseeded with native bunchgrasses on three different occasions following wildland fires. Each of the three treatments failed to result in substantial recovery of native bunchgrasses, allowing for the continued expansion and establishment of the site by cheatgrass. The use of non-natives within the seed mix would increase the likelihood of the seeded species outcompeting the established cheatgrass and allowing for the reestablishment of deep-rooted perennial bunchgrasses into the site. While

the site would consist of a more natural distribution of deep-rooted perennial bunchgrasses, these seeded non-native species would modify the vegetation composition of the site resulting in the need for further implementation to transition the site from non-native perennial bunchgrass species to native perennial bunchgrass species once the site has stabilized and cheatgrass is no longer a dominant feature on the landscape.

Alternative C (No Action Alternative)

Under this action, perennial grasses, forbs and shrubs would not be seeded or planted in degraded or disturbed areas except where site specific analyses have been conducted. Present vegetation in these areas would continue their life-cycles without direct impact. As a result, any potential for these areas to increase in vegetative diversity and transition from their current degraded state, would not occur or would occur at a much slower pace through natural reestablishment.

Wildlife Resources

Affected Environment

This section includes Special Status Species (Animals), Migratory Birds, and General Wildlife.

Special Status Species (Animals)

All data known to the Upper Snake Field Office, including data from U.S. Fish and Wildlife Service (USFWS), Idaho Department of Fish and Game, and the Idaho Natural Heritage Program has been considered to identify any animal species currently listed under the Endangered Species Act (ESA). There are no threatened or endangered species known within the project area. There is one candidate species, greater sage-grouse, which can be present, at various times of the year, throughout the 11 treatment units.

Habitat for BLM Special Status Species are currently managed under the direction of the BLM Manual 6840, and Instruction Memorandum No. 2015-009 - Idaho Bureau of Land Management (BLM) Special Status Species List Update (DOI-BLM 2015). This policy directs land management activities to "...manage Bureau sensitive species and their habitats to minimize or eliminate threats affecting the status of the species or to improve the condition of the species habitat" (DOI-BLM 2009).

Table 18 lists special status species that have been identified as occurring or potentially occurring within the project area. BLM includes the following as special status species:

Type 1 – ESA Listed Species: includes Endangered and Threatened Species

Type 2 – BLM Special Status Species: includes USFWS Candidate Species, species delisted within 5-years, Proposed Species, experimental populations, and BLM Sensitive Species

The probability of species occurring and rationale for occurrence are listed. Species not occupying seasonal ranges or not expected to occur within the 11 treatment units that makeup the project area are not discussed in the assessment.

Table 18: Special Status Species and Occurrence within Sagebrush Steppe Restoration Project.

Species	Status ^a	Occurrence	Rationale
Greater Sage-Grouse (<i>Centrocercus urophasianus</i>)	2	Present	Preliminary Priority Habitat and Preliminary General Habitat.
Ferruginous Hawk (<i>Buteo regalis</i>)	2	Potential	Potential breeding habitat present.
Golden Eagle (<i>Haliaeetus leucocephalus</i>)	2	Potential	Potential breeding habitat present.
Burrowing Owl (<i>Athene cunicularia</i>)	2	Potential	Potential breeding habitat present.
Short-eared Owl (<i>Asio flammeus</i>)	2	Potential	Potential breeding habitat present.
Black-throated Sparrow (<i>Amphispiza bilineata</i>)	2	Potential	Potential breeding habitat present.
Brewer's Sparrow (<i>Spizella breweri</i>)	2	Potential	Potential breeding habitat present.
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	2	Potential	Potential breeding habitat present.
Sagebrush Sparrow (<i>Amphispiza belli</i>)	2	Potential	Potential breeding habitat present.
Green-tailed Towhee (<i>Pipilo chlorurus</i>)	2	Potential	Potential breeding habitat present.
Sage Thrasher (<i>Oreoscoptes montanus</i>)	2	Potential	Potential breeding habitat present.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	2	Potential	Breeding habitat present.
Piute Ground Squirrel (<i>Spermophilus mollis artemisiae</i>)	2	Potential	Potential habitat present.
Pygmy Rabbit (<i>Brachylagus idahoensis</i>)	2	Potential	Potential habitat present.
Long-legged Myotis (<i>Myotis volans</i>)	2	Potential	Potential habitat present.
Pallid Bat (<i>Antrozous pallidus</i>)	2	Potential	Potential habitat present.
Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>)	2	Potential	Potential habitat present.
Western Small-footed Myotis (<i>Myotis ciliolabrum</i>)	2	Potential	Potential habitat present.
Yuma Myotis (<i>Myotis yumanensis</i>)	2	Potential	Potential habitat present.

Status Codes: C=Federal Candidate Species, S=BLM Sensitive Species

On March 23, 2010 the US Fish and Wildlife Service determined that listing of the greater sage-grouse range-wide was warranted but precluded by higher listing actions (75 FR 55). Habitats for sage-grouse within the BLM are currently managed under Instruction Memorandum No. 2012-043 - Greater Sage-Grouse Interim Management Policies and Procedures. Locally management actions also follow the Big Desert Local Working Group's Sage-Grouse Conservation Plan (BDLWG 2010), the Upper Snake Local Working Group's Plan for Increasing Sage-Grouse Populations (USLWG 2009), and the Conservation Plan for Greater Sage-Grouse in Idaho (ISGAC 2006).

Greater sage-grouse occurrence is strongly correlated with the distribution of sagebrush habitats as they depend on a variety of shrub steppe habitats throughout their life cycle, and are considered obligate users of several species of sagebrush (USFWS 2010). They exhibit strong site fidelity to seasonal habitats (USFWS 2010). In general, the Preliminary Priority Habitat (PPH) designation is based on sage-grouse populations as identified in *Sage-grouse Priority and General Areas in Idaho* (Makela and Major 2011). In particular, PPH is based on combined high male lek attendance, high lek density and high lek connectivity. Preliminary General Habitat (PGH) is defined as areas of occupied seasonal or year-round habitat outside of priority habitat. Key Habitat is described as areas of generally intact sagebrush that provide sage-grouse habitat during some portion of the year (ISGAC 2006). Impacts in these areas may result in impacts to sage-grouse population centers and movement corridors. The Sagebrush Steppe Restoration project consists of approximately 70,320 acres of BLM administered lands, all of which has been identified as Key Habitat for sage-grouse. Approximately 36,930 acres of the project area are identified as PPH and the remaining 33,390 acres are identified as PGH (See Appendix A, Map 7).

In Idaho, based on long-term averages dating back to the late 1960's, greater sage-grouse shows a declining population trend (Connelly et al. 2004). Sage-grouse breeding populations are monitored by counting the number of males attending leks during the spring. Consistent annual monitoring of standardized lek routes provides trend data that can be utilized to create comparison between years and/or different areas. The proposed project area contains numerous sage-grouse leks from two separate Sage-Grouse Planning Areas (SGPAs), the Big Desert and the Upper Snake. The most recent sage-grouse population data, collected in 2014, indicates that the total number of males recorded at leks within the Big Desert SGPA is down approximately 4.5% from the 2013 total, but is within 1% of the previous 5-year average (ISGAC 2015). The total number of males recorded at leks within the Upper Snake SGPA is up approximately 5.5% from the 2013 total, but is down approximately 11.75% from the previous 5-year average (ISGAC 2015).

As previously mentioned, the entire project area is within both Key Habitat for sage-grouse and either PPH or PGH. However, approximately 87% (60,920 acres) of the project area has been affected by wildfire since 1995, altering the sagebrush communities in these areas. Although sagebrush re-establishment has been documented within the project area, the rate of re-establishment in some areas has been hampered by repeated wildfire events. As a result of the reduced sagebrush cover, a large portion of the PPH and Key Habitat within the project area is currently considered to be Potential Restoration Habitat Type I – Perennial Grasslands (approximately 57,766 acres) and Potential Restoration Habitat Type II – Annual Grasslands (approximately 1,287 acres). The perennial grassland areas are defined as “sagebrush-limited areas characterized by perennial grass species composition and/or structure that should provide suitable potential nesting habitat in the future, once sufficient sagebrush cover is re-established (at least 10% canopy cover)” (ISGAC 2006). Potential Restoration Habitat Type II – Annual Grasslands are defined as “areas dominated or strongly influenced by invasive annuals such as cheatgrass or similar species; and include areas where sagebrush may be present, but, in general, understories are not suitable for sage-grouse” (ISGAC 2006).

The project area may provide breeding, upland summer (late brood-rearing), and winter habitat for sage-grouse. However, due to the reduced sagebrush canopy cover throughout most of the project area, these seasonal habitats are currently only considered marginally suitable at best, based on the protocol established by Stiver et al., 2010 to assess sage-grouse habitat suitability. Marginal seasonal habitats are described as “sagebrush cover types that do not provide the shelter needs for protection from predators and weather, and/or food resources are present but not at levels expected for ecological site potential or not in close proximity” (Stiver, et al. 2010). Sage-grouse are a “sagebrush obligate” species which require sagebrush throughout their life cycle for cover, nesting, and food (Crawford, et al. 2004). Because of the reduced amount of sagebrush cover associated with past wildfire events; seasonal habitats within the project area are not expected to be in suitable condition of providing sage-grouse with adequate habitat requirements as described by Stiver et al., 2010.

Ferruginous hawks inhabit grasslands, shrub steppes, and deserts of North America and use sparse riparian forests, canyon areas with features such as cliffs and rock outcrops, and isolated trees and small groves of trees in grassland and shrub-steppe areas for nesting (Bechard and Schmutz 1995). Natural features within the project area provide potential nesting and foraging habitat for the ferruginous hawk.

Golden eagles inhabit a very wide distributional range, and occupy a variety of habitat types within that range. They exist primarily in mountainous or hilly terrain, canyons, and rimrock terrain within shrub-steppe or grassland habitat (Kochert, et al. 2002). Feeding primarily on rabbits and other small to medium-sized mammals, golden eagles typically forage in shrub-

steppe and other open habitat types. They have also been documented foraging along the edge between shrub-steppe and woodland habitats, although interior woodland habitat is typically avoided (Kochert, et al. 2002). Most commonly utilized habitats also include some proximity to cliffs, and other rocky features, for available nesting substrate (Kochert, et al. 2002). Natural features within the project area provide potential nesting and foraging habitat for this species.

Burrowing owls generally occur in treeless areas within grassland, shrub-steppe, and desert habitats. They are typically associated with gently sloping areas containing sparse, low-growing vegetation (Poulin, et al. 2011). Although they also feed extensively on insects, burrow sites are often associated with high densities of burrowing mammals (Poulin, et al. 2011). Burrowing owl populations have declined significantly throughout much of their North American range. In Idaho they are patchily distributed along the southern portion of the state, but the population size is unknown (IDFG 2005). Potential burrowing owl habitat exists within the project area.

Short-eared owls are widely distributed and occur throughout much of North America. They are a ground-nesting species that inhabit grasslands, shrub-steppe, agricultural areas, and other open habitat types (Wiggins, et al. 2006). They are active during both day and night, flying low above the ground to hunt small mammals. The vegetative structure within the project area may provide potential nesting and foraging habitat for this species.

Black-throated sparrows are generally associated with semi-open habitats containing evenly spaced shrubs and trees (Johnson, et al. 2002). In Idaho, they nest almost exclusively in sagebrush and prefer relatively open stands of scattered, tall-growing sagebrush and other shrub species (Johnson, et al. 2002). Black-throated sparrows are an omnivorous ground-feeding species, focusing on insects during the breeding season and seeds and other plant matter during the non-breeding season. Potential habitat for the black-throated sparrow within the project area would be minimal in areas containing a reduced sagebrush cover.

Brewer's sparrows breed in shrub-steppe, transitions between shrub-steppe and other habitat types, and semi-desert shrub-steppe habitats (Walker 2004). Brewer's sparrows are gleaners, consuming small insects, gleaned from foliage and bark of shrubs or dwarf trees and seed taken from the ground (Rotenberry, et al. 1999). Reduced occupancy, nest success and season-long productivity in fragmented shrub-steppe habitats suggest smaller patches of habitat are of marginal suitability (Walker 2004). Potential habitat for the Brewer's sparrow within the project area would be minimal in areas containing a reduced sagebrush cover.

Grasshopper sparrows are a grassland species which prefer relatively open grasslands containing patches of bare ground (Vickery 1996). They are a ground-nesting species and build their nests at the base of tall grasses. Grasshopper sparrows feed on the ground, focusing on insects during

the breeding season and grass seeds during the non-breeding season. Although individuals in the western United States appear to prefer areas with some shrub cover, they will generally avoid grasslands with an extensive shrub cover (Vickery 1996). The previously burned portions of the project area contain relatively low shrub canopy cover and may provide potential grasshopper sparrow habitat.

Sagebrush sparrows are dependent on stands of sagebrush for nest sites, food, and cover (Vander Haegen 2003). They prefer semi-open habitats with evenly spaced shrubs 3-6 feet high (Martin and Carlson 1998) and are found more frequently in extensive areas of continuous sage (Vander Haegen 2003). Sagebrush sparrows are ground foragers that eat insects, spiders, seeds, small fruits and succulent vegetation (Martin and Carlson 1998). Potential habitat for the sagebrush sparrow within the project area would be minimal in areas containing a reduced sagebrush cover.

The green-tailed towhee is an ecotone species which inhabits slopes in shrub-steppe habitat, often interspersed with trees (Dobbs, et al. 2012). They prefer areas with a diversity of shrub species, often dominated by sagebrush, or within open juniper woodlands containing a strong shrub component in the understory. Green-tailed towhees usually occur in areas containing forest edge habitat, and/or that have previously been disturbed, but avoid interior forest habitat (Dobbs, et al. 2012). The project area may contain potential green-tailed towhee habitat, however the ecotone habitat characteristics preferred by this species may be lacking throughout most of the project area.

Sage thrashers are considered a sagebrush obligate species, exclusively dependent on the sagebrush-steppe ecosystem for breeding habitat (Reynolds and Rich 1978). They rely on stands of big sagebrush for nesting and are positively correlated with sagebrush cover, patch size, decreased disturbance, and proximity to similar habitat (Reynolds, et al. 1999). They feed primarily on insects, picking them off the ground, but have also been observed foraging on berries when available (Reynolds, et al. 1999). Potential habitat for the sage thrasher within the project area would be minimal in areas containing a reduced sagebrush cover.

Loggerhead shrikes are passerines that prey upon reptiles, mammals, other birds and a wide array of invertebrates (Woods and Cade 1996). They are widely distributed throughout the southern portion of Idaho and are often locally abundant where they occur (Woods and Cade 1996). Loggerhead shrikes are known to use a variety of habitats including prairies, pastures, and sagebrush desert (Dechant, et al. 2002). Habitat must include suitable nesting shrubs or small trees and hunting perches interspersed over a grassy or herbaceous ground cover with some bare areas, where shrikes find most of their prey (Cade and Woods 1997). There is little information available on loggerhead shrikes within the project area, however potential habitat does exist.

Piute ground squirrels are found in arid high desert habitats such as sagebrush, shadscale or greasewood communities, and are known to make extensive burrow networks (Rickart 1987). Their diets are comprised mostly of herbaceous vegetation and seeds, but they have also been documented feeding on shrub parts and animal matter (Rickart 1987). Potential habitat for the Piute ground squirrel exists within the project area; however the reduced sagebrush cover would minimize the habitat quality of these areas.

Pygmy rabbits are sagebrush obligate species inhabiting dense, tall stands of big sagebrush growing on deep, friable soils that allow them to dig extensive burrow systems (Janson 2002). Landscape features include alluvial fans and hillsides, swales within rolling topography, floodplains, brushy draws, riparian channels, edges of rock and lava outcroppings, and mima mounds (IDFG 2005). The portions of the project area containing stands of tall sagebrush would provide potential pygmy rabbit habitat. However, the reduced sagebrush cover in most of the project area would provide only minimally productive habitat if any.

Sagebrush-steppe provides potential foraging habitat for a variety of special status bat species, including: Townsend's big-eared bat, pallid bat, long-legged myotis, Yuma myotis, and western small-footed myotis. Habitat preferences vary among these species, and many utilize an array of different habitat types throughout the year. However, all of these species feed exclusively on insects and they ultimately rely on productive vegetation for cover and forage for their insect prey base. Some species, such as Townsend's big-eared bat and western small-footed myotis, contain habitat requirements that are very closely associated to areas containing caves or cavern-like structures available for roosting, during all stages of its life cycle (Gruver and Keinath 2006). Distances traveled from roosts to foraging areas for Townsend's big-eared bats can be as much as 18 miles (Fellers and Pierson 2002). The vegetative structure within the project area, as well as proximity to potential roosting sites, may provide potential foraging habitat for several special status bat species.

Migratory Birds

The project area consists primarily of sagebrush-steppe habitat containing lava outcrops, lava flows, and other volcanic extrusions. Sagebrush-steppe provides habitat for numerous migratory bird species, such as: black-throated sparrow, Brewer's sparrow, sagebrush sparrow, vesper sparrow, sage thrasher, loggerhead shrike, western meadowlark, and burrowing owl. Some of these species are considered to be sagebrush obligate species, such as the sage thrasher, Brewer's sparrow, and sagebrush sparrow; and are dependent on this habitat type during one or more stages of their life cycles. These species typically favor large stands of continuous sagebrush cover containing an herbaceous vegetative understory. The migratory bird community is most diverse when the pattern of plant communities is most structurally diverse (Sands et al. 1999).

The project area may also be utilized during different seasons by migratory raptor species, such as: rough-legged hawk, ferruginous hawk, red-tailed hawk, Swainson's hawk, northern harrier, prairie falcon, golden eagle, and short-eared owl. Habitat requirements differ between these species. Although some species, such as Swainson's hawk, require sparse trees for nesting, most species require open grassland or shrub-steppe habitat types for foraging. Rocky outcrops within the project area may provide potential nesting substrate for cliff nesting species such as prairie falcons. Ferruginous hawks mainly forage in shrub-steppe and other open habitats, but often seek isolated trees or small groves of trees within these habitat types for nesting (Bechard and Schmutz 1995).

Inventory and monitoring data are limited or absent for many migratory bird species, including sagebrush obligates, within the project area. Little is known about their population status or trends. However, most of the project area has been impacted by wildfire events since 1995. Wildfire in sagebrush-steppe habitat causes a dramatic shift in the species composition of the avian community (Sands et al. 1999). The loss of sagebrush reduces the amount of potential cover, nesting, and foraging substrate available for sagebrush obligates and other shrub-nesting bird species. However, grassland bird species such as the vesper sparrow and western meadowlark typically favor these habitat conditions. Additionally, in some areas wildfire has facilitated the infestation of cheatgrass, altering the composition and structure of the vegetative community and altering fire-return intervals. Studies in south-central Idaho suggest that bird species richness and breeding densities are greatly reduced in these areas when compared to sagebrush-steppe habitat (Sands et al. 1999).

Wildlife

The sagebrush-steppe habitat within the project area, combined with the undulating topography associated with lava features, provides the potential to support a wide variety of wildlife species, including those which seasonally occupy different habitat types.

The project area contains identified crucial winter, spring, and yearlong habitat for pronghorn, and important yearlong habitat for elk and mule deer. Pronghorn rely heavily on eyesight and speed to escape predation, provided by the relatively low structure associated with unfragmented sagebrush-steppe habitat (Sands et al. 1999). Elk and mule deer also utilize open sagebrush habitat types during different times of the year, and foliage from big sagebrush has been identified as an important component to the fall and winter diet of mule deer (Hoskins and Dalke 1955). Healthy sagebrush-steppe habitat, with a diverse composition of shrubs and herbaceous vegetation, can provide adequate year-round forage for pronghorn, elk, and mule deer populations (Sawyer et al. 2007).

Sagebrush-steppe provides habitat for a variety of small mammal species, including: deer mouse, northern grasshopper mouse, black-tailed jackrabbit, and various vole and ground squirrel species. Habitat preferences vary among these species, however they ultimately rely on productive vegetation for cover and forage for themselves and/or their prey base.

The vegetative cover and undulating topography associated with the project area provides potential foraging habitat for predatory mammals, such as coyotes, bobcats, and weasels. Badgers are also commonly associated with open habitats such as sagebrush-steppe. These species rely on vegetation mainly as a source of cover while hunting and/or hiding, and for providing the habitat requirements of the species that form their prey base.

Reptile species expected to be found within the project area include: gopher snake, prairie rattlesnake, short-horned lizard, and sagebrush lizard. These species readily utilize sagebrush habitat types and rely on productive vegetation for cover and to provide forage for their prey bases.

Resident bird species expected to be found within the project area include: dark-eyed junco, horned lark, American kestrel, common raven, and black-billed magpie. These species rely on productive vegetation to provide cover, and/or to provide habitat requirements of the species that form their prey base.

Approximately 60,920 acres of the project area has been affected by wildfire since 1995, altering the sagebrush communities in these areas. The reduced sagebrush cover within these areas may reduce the potential habitat quality for most wildlife species which rely on diverse and productive vegetation for themselves and/or their prey bases. Additionally, some areas within the project area currently contain a dominant cheatgrass cover, providing very poor habitat quality. Most sagebrush-steppe wildlife species do not benefit from loss of shrubs and the invasion of cheatgrass, and many species, particularly shrub obligates, decline within or abandon these areas (Sands et al. 1999). There is no trend data available for resident birds, reptiles, or most mammals within the project area.

Environmental Consequences

Alternative A (Proposed Action)

Implementation of the proposed action is expected to improve habitat conditions for most wildlife species within the project area. The hand planting of sagebrush and seeding of native herbaceous species would enhance the potential for re-establishment of native species in areas impacted by past wildfire events. Although the re-establishment of sagebrush cover in these areas may take a number of years, it is expected that the long-term effects would greatly benefit

the sagebrush-steppe habitat and its wildlife communities. Re-establishment of native shrub and herbaceous species would benefit wildlife species by increasing vegetative structure and diversity and providing more potential cover, nesting, and foraging habitat. Additionally, an increase in vegetative production and diversity would likely have a positive influence on the insect communities within these habitats, potentially providing an increase in a major prey source for many small wildlife species. Sagebrush obligate species, such as greater sage-grouse, sagebrush sparrow, sage thrasher, Brewer's sparrow, pygmy rabbit, and Piute ground squirrel; would greatly benefit from the increase in sagebrush cover, as they are dependent on this habitat type during one or more stages of their life cycles. Sands et al. (1999) concluded that ecologically intact sagebrush communities have a higher diversity of both vegetation and wildlife species than degraded sites, and that the vertebrate community is most diverse when the pattern of plant communities is most structurally diverse. Ground-nesting and grassland species would benefit from an increase in native herbaceous vegetation available as potential cover and nesting habitat. However, it is expected that as the sagebrush cover increases the avian species composition would transition toward species that prefer more shrub dominant habitat, such as sagebrush obligates.

Chemical treatments would be utilized prior to planting and seeding to reduce or eliminate the anticipated growth and competition from cheatgrass. Control of cheatgrass would prevent further habitat degradation caused by this species, and maximize the potential for re-establishment of native species. Chemical treatments have the potential to kill non-target vegetation used by wildlife, through improper application and/or drift. However, to reduce the potential for drift and offsite application the site would be sprayed within four hours of sunrise when wind velocities are less than five mile per hour (5 MPH). Herbicide use could also potentially cause negative health effects through exposure and/or direct consumption of sprayed vegetation by wildlife and/or their prey base. However, by following proper application methods, the potential for these adverse impacts would be minimized. Impacts associated with the killing of non-target species and exposure of birds to herbicides would be out-weighted by the long-term improvement of habitat associated with the removal of cheatgrass and the re-establishment of native vegetation.

Temporary fences would be constructed around treated areas to control livestock grazing. Controlling livestock grazing within the treated areas may provide an increase in vegetation available to wildlife as potential forage or cover. Potential impacts to greater sage-grouse, and other wildlife species, from the installation of new fences would include disturbance and displacement during installation phase, fence posts that may provide perches for predators, and the fences may pose a collision hazard (Stevens et al. 2012, Connelly et al. 2004). According to Connelly, placement of new fences and structures should be avoided within 1 km (0.6 mi) from

occupied leks (Connelly et al. 2000), and the BLM IM-2012-043 suggests evaluating any new fences within 1.25 miles of leks that have been active within the past 5 years. These criteria would be considered when determining if temporary fences are necessary throughout the project. The installation of new fences may negatively affect wildlife movement patterns as the fences may pose as barriers. Wildlife, particularly big game species, also has the potential to become entangled in the new fence. However, all fences would be built to meet BLM wildlife specifications, which would allow for easier passage and reduce the influence of fences on wildlife movement. All of the temporary fences built would be electric fences. As little research has been done on the effect of electric fences on wildlife population in SE Idaho; interim electric fence policy written by the BLM Rawlins Field Office would be used to mitigate impacts to wildlife. It states that one, two, and three-wire electric fences may be built on public lands, as long as the top wire is no higher than 42 inches from the ground and the bottom wire is a minimum of 16 inches from the ground. If the bottom wire is 16 inches it would not be electrified to allow antelope passage; a 20 inch bottom wire spacing would be required if the wire is electrified. A 42 inch top wire is passable by mature mule deer and elk, whether electrified or not. The middle wire should be a minimum of 12 inches below the top wire. Many experiences in the Rawlins Field Office area have shown that for individual animals approaching an electric fence, antelope go under and deer and elk jump over. When these animals are in large numbers they run through these fences, because of the fences' construction material and inability to withstand extensive pressure. These types of electric fences seem to have less impact on wildlife movement than the conventional fence type. Additionally, reflective markers would be installed along the top wire to provide a visual indicator of the presence of the fences, reducing potential for wildlife collisions.

Human activity associated with this project could cause some wildlife species to become temporarily displaced, or even abandon their nest sites, although the potential is limited. A small amount of noise from ATVs may also disturb wildlife during plantings. However, these effects are expected to be short-term in duration, and have little impact on the wildlife species within the project area.

Impacts to wildlife, and/or their habitat, would be more beneficial under Alternative A when compared to the current situation (Alternative C). Although this alternative may involve some disturbance to wildlife associated with human activity, fencing, and chemical treatment; it would increase the structure and diversity of native vegetation within the project area. This would provide wildlife with more potential cover, foraging, and nesting habitat than the current situation (Alternative C) provides.

Alternative B (Native/Non-native Seeding)

Impacts to wildlife species, and/or their habitat, from Alternative B would be similar to those discussed under Alternative A. However, the proposed project area would consist of only the 25,440 acres within the Stage Road treatment unit, as opposed to the 70,320 acres proposed under Alternative A.

Most wildlife species would ultimately benefit from an increase in vegetative structure and diversity associated with hand planting of sagebrush and seeding of grasses. Under this alternative the use of a native/non-native seed mix would be utilized. An increase in perennial grasses would benefit most wildlife within this area by providing additional vegetation available as potential cover, nesting, and foraging habitat. However, comparable levels of wildlife abundance may not occur within this area unless microhabitat structure is similar to that of native vegetative species (Sands et al. 1999). Numerous studies have indicated that the ecologically simpler habitat associated with non-native seedings is likely to have lower wildlife diversity than sagebrush with an understory of native grasses and forb species (Sands et al. 1999). However, this occurs most readily in areas containing monocultures of non-native grasses. The seed mix proposed under this alternative would include native perennial grasses in addition to non-native wheatgrass, and it is expected that the habitat structure would remain similar to that of native vegetative species. The use of non-native grasses within the seed mix would increase the potential for seeded species to compete with the established cheatgrass within the project area. A study conducted by Asay et al. (2000), concluded that native wheatgrasses were more difficult to establish, less productive, and less persistent than introduced wheatgrasses in arid to semi-arid environments. This study also suggests the use of an adapted, noninvasive, introduced wheatgrass, such as *Vavilov*, as a component of the seed mix when attempting to re-vegetate environmentally harsh and disturbed sites (Asay et al. 2000). The use of such a seed mix would be consistent with the Vegetation Management Objectives under the Idaho and Southwestern Montana Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement (DOI-BLM and USDA-USFS 2015) which states: “Non-native seeds may be used as long as they support sage-grouse habitat objectives (Pyke 2011) to increase probability of success, when adapted seed availability is low or to compete with invasive species especially on harsher sites.”

Impacts to wildlife, and/or their habitat, would be more beneficial under Alternative B when compared to the current situation (Alternative C). Although this alternative may involve some disturbance to wildlife associated with human activity, fencing, and chemical treatment; it would provide wildlife with more potential cover, foraging, and nesting habitat compared to the current situation (Alternative C).

Under this alternative, the use of non-native wheatgrass as a component of the seed mix would increase the potential for seeded species to compete with established cheatgrass of degraded sites (Asay et al. 2000), when compared to the use of a strictly native seed mix as under Alternative A. Therefore, this alternative may provide more perennial grasses available as potential cover, foraging, and nesting habitat when compared to Alternative A. However, the species composition may not be as diverse under Alternative B when compared to that of Alternative A. Sagebrush communities containing an understory of native grasses and forbs provide for a wider diversity of wildlife species than non-native seedings (Sands et al. 1999).

Alternative C (No Action Alternative)

Implementing the no action alternative would not have direct effects on wildlife. Indirectly, species which are expected to benefit from the improvement of habitat through shrub planting would continue to have less suitable habitat for a much longer period of time (up to 50 years or more) until natural establishment occurs or a site specific analysis allows for the replanting of the site.

Impacts to wildlife, and/or their habitat, under Alternative C would be less beneficial when compared to both Alternatives A and B. Although there would be no potential disturbance to wildlife associated with human activity, fencing, and chemical treatment under Alternative C; the current vegetative conditions would continue to provide only marginally productive wildlife habitat. Areas containing degraded understories or reduced sagebrush canopy cover would rely solely on natural establishment to increase the vegetative structure and diversity. It is likely that cheatgrass would continue to expand in areas where it is currently established, further degrading the quality of habitat for most wildlife species within the project area.

Chapter 4 - Cumulative Impacts

This section of the document discloses the incremental impacts that the Proposed Action and Alternative are likely to have when considered in the context of impacts associated with past, present, and reasonably foreseeable future actions that have occurred, or are likely to occur, in the area.

Due to the large expanse which this EA encompasses, the Cumulative Impact Assessment Area (CIAA) consists of those lands that are within the USFO boundary including lands managed by the State of Idaho, other federal agencies, and private holdings. The total acreage of these lands is 7,129,429 acres. These lands when broken down into management consists of: 2,618,387 acres of privately owned lands, 1,809,280 acres of lands managed by the BLM, the US Forest Service manages 1,666,183 acres, the Department of Energy (DOE) manages 542,498 acres with the State of Idaho managing 385,231 acres. The remaining 78,554 acres is split among other Governmental and Tribal agencies. Map 7 in Appendix A shows the CIAA boundary and management agencies.

Past and Present Actions

Past, present, and reasonably foreseeable actions that have occurred in the CIAA have impacted the human environment to varying degrees (see Table 19). These actions include vegetation management, fire, agricultural development, and infrastructural development. Although these actions probably do not account for all of the impacts that have or are likely to occur, GIS analysis, agency records, and professional judgment suggest that they have contributed to the vast majority of cumulative impacts that have occurred in the assessment area.

Table 19: Past and Present Actions Within the CIAA

Type of Activity	Past and Present Actions
<i>Agricultural Development</i>	
<i>Cultivated crop agriculture, both dryland and irrigated</i>	1,502,494 acres
<i>Urban Development</i>	
<i>Buildings and other structures, concrete and asphalt pads</i>	140,501 acres
<i>Wildfire History</i>	
<i>Total Acres Burned</i>	1,076,231 acres
<i>Vegetation Management</i>	

Type of Activity	Past and Present Actions
<i>Reseeding</i>	433,901 acres
<i>Prescribed Fire</i>	141,293 acres
<i>Invasive/Non-Native Species</i>	
<i>Noxious weeds</i>	26,879 acres
<i>Non-native Perennial Grasses</i>	163,016 acres
<i>Annual Grasslands</i>	81,083 acres
<i>Livestock Grazing</i>	
<i>Number of Allotments</i>	676 Allotments encompassing 4,192,791 acres
<i>Infrastructure Development</i>	
<i>Miles of Road</i>	18,305 Miles
<i>Power lines (high voltage)</i>	550 Miles
<i>Railroad</i>	580 Miles
<i>Rivers, Canals, Streams</i>	1,528 Miles
<i>Reservoirs</i>	85,412 acres
<i>Communication Towers</i>	186 sites
<i>Fence lines</i>	6,184 miles

Reasonably Foreseeable Future Actions

The effects of the Proposed Action and Alternative are expected to vary widely by resource. For some resources, effects would be very short-term, lasting only during project implementation. For others, effects would last for years. In the interest of consistency, a 10-year timeframe was used to consider the incremental effects of reasonably foreseeable future actions.

All of the past and present actions discussed above are expected to persist through this time frame, though the relative intensity of these actions could vary depending on a variety of economic factors or changes in management direction.

Cumulative Impacts associated with Past, Present, and Reasonably Foreseeable Future Actions

Each of the past, present, and reasonably foreseeable future actions contribute a specific incremental environmental effect that can be described or accounted for with the same indicators as used in the alternative analysis presented earlier in the document. The proper indicator depends upon the analysis method used and the resource affected by the action. Indicators might be measured by the acres of soil disturbed, acres of big game habitat affected, percentage change in ground cover, or another indicator that is best used to describe and account for the accumulated effect to the particular resource. The accumulated effect of past, present, and reasonably foreseeable future actions on a given resource provides a baseline from which to evaluate the contribution of the alternatives to the collective impact on that resource. This purpose of this section of the document is to provide that baseline. The effects of the various alternatives on the baseline are presented in a subsequent section.

Past and present actions have resulted in varying degrees of impact to the resources considered in the analysis. Impacts are higher for urban and rural areas which have resulted in direct habitat loss and fragmentation of approximately 37% of the CIAA. Urban and rural development has altered or removed native vegetation communities, changed soil characteristics, and introduced elements such as accelerated erosion, irrigation and concentrated fertilization that have altered and would continue to alter the characteristics of the natural landscape.

Impacts associated with infrastructure development have resulted in direct habitat loss and fragmentation of less than <1% of the CIAA. Infrastructure often affects natural habitats differently than agriculture or urban development. In the case of roads and fences, the impacts are often drawn out over a linear area rather than as agriculture and urban development impacts are in large, concentrated blocks. Although infrastructure may influence natural areas in different ways, the impacts are similar in removing the native vegetation communities and introducing non-natural elements into the natural landscape.

Within the CIAA there is approximately 4,192,791 acres designated as grazing allotments. These lands include private, State, BLM and Forest Service management areas. Fencing is commonly used as a livestock management tool and there are approximately 6,184 miles of fence occurring throughout the CIAA. Using an average impact area of 4 feet along all fences, the total area affected by fencing is approximately 2,998 acres, which is less than 1% of the total area within the CIAA.

Activities that occur on public and private lands, such as agricultural practices; infrastructure development; recreational use such as camping, hunting, and ATV use; and livestock grazing

management affect wildlife use patterns, the quantity and quality of habitats, and population viability. Many species of wildlife including birds, bears, and big game require large intact habitats for their continued survival. Urbanization and recreational opportunities on adjacent private lands reduces their value to wildlife habitat through fragmentation of existing habitats. Cumulative impacts of livestock grazing on wildlife habitat include compaction of soils, reduction of available forage and cover, and disturbance of riparian vegetation. Maintaining intact habitats and having the flexibility to modify grazing schedules to meet the specific needs of vegetation and wildlife would help maintain rangelands in good ecological condition.

Cultural Resources

Cultural resources have been impacted by past, present, and reasonably foreseeable future actions such as livestock grazing, agriculture, infrastructural developments, recreation, vegetative treatments, and wildland fires. A majority of the impacts to cultural resources in the CIAA have occurred and would occur on non-federally administered lands. Impacts to cultural resources on federally-administered lands from past actions more than likely occurred prior to 1966 because there was no law requiring federal agencies to consider effects of actions on cultural resources. Although the National Historic Preservation Act (NHPA) was signed into law in 1966, it took some time to generate the staff necessary to manage cultural resources and implement the regulations outlined in 36 CFR 800 or Section 106 review. Past actions that occurred prior to 1980 may or may not have been subjected to Section 106 review. If these actions were subject to Section 106 review, it would not have been up to current standards. Therefore, past actions on federally administered lands prior to 1980 are assumed to have had impacts on cultural resources.

Within the CIAA, over 4,000 archaeological and historical sites have been identified and recorded; approximately 1,600 of these are located on BLM-administered lands. These sites represent continuous human occupation and use of the region for the last 11,000 years.

Livestock grazing has been occurring within the CIAA since the early 1880s. More than half (60%) of the acreage in the CIAA is within an allotment used for cattle and sheep grazing. Grazing is a generally dispersed, non-intensive activity, and impacts to cultural resources are mainly surficial, resulting in horizontal displacement of artifacts and some erosion. However, in areas of livestock congregation the impact is more severe causing movement, mixing, and damage to artifacts.

Land in agricultural production within the CIAA totals approximately 1.5 million acres. This activity primarily occurs on private land in the southern and eastern portions of the CIAA. These lands are within 10 miles of the Snake River and lava flows. The Upper Snake FO cultural

resource sensitivity model suggests that these areas have moderate to very high resource potential due to their proximity to water and lava edges. Due to the lack of cultural resource protection laws on private lands, cultural resources located in these areas have been impacted by plowing and erosion. Typically, the historic plow zone is restricted to the top 30 centimeters of soil; therefore, if there are subsurface cultural deposits below 30 centimeters, they may still be intact.

Vegetation treatments have occurred throughout the area since the 1960s totaling approximately 575,194 acres. Vegetation treatments that occurred prior to 1980, more than likely did not have cultural resource inventories conducted prior to the treatment. However, since 1980, vegetation treatments have been subject to Section 106 review. Impacts to cultural resources from prescribed fire, and chemical, mechanical, and seeding treatments have been minimized through avoidance and other mitigation measures. Impacts from chemical treatments to cultural resources include the introduction of erosive materials to certain artifact types and contaminate traditionally used plant materials.

The CIAA has been impacted by wildfires, totaling approximately 1.1 million acres. As discussed in the cultural resource section of environmental consequences, damage to archaeological sites from fire predominantly relates to the severity and duration of the fire. High severity burns, in general, result in increased damage to artifacts, features, and architecture of archaeological sites as well as increase the chance of erosion also damaging these sites. Approximately 15% (1.1 million acres) of the CIAA has been burned by wildfire and 575,194 acres (8%) of the CIAA has been subjected to vegetation rehabilitation treatments. Wildfire will continue to impact cultural resources and rehabilitation efforts are highly likely to occur following wildfires in the CIAA. Impacts to cultural resources due to rehabilitation efforts would be minimized through Section 106 review.

Developed linear infrastructure cover 19,435 miles within the CIAA. Construction of these roads, railroads, and power lines, on non-federally administered lands or prior to 1980 on federally-administered lands, has likely had direct impacts to cultural resources. Direct impacts may have destroyed sites, bisected sites, or disturbed the surficial and subsurface cultural deposits. An indirect impact from roads includes providing access to areas with cultural resources, which may increase unauthorized collection or vandalism. Reservoirs impacting approximately 85,412 acres may have inundated cultural resources located at lower elevations, and exposed cultural resources to fluctuating water levels at higher level elevations around these reservoirs.

Fisheries

Within the CIAA there are approximately 1,325 miles of main rivers and creeks and 80 miles of lakes and reservoirs. Of the 1,325 miles of river, 819 miles flow through privately held lands. Before the 1880s these lands were not heavily used for agriculture, but have since been developed. This development also included the construction of irrigation canals that divert thousands of gallons of water from rivers during the summer to water crops. The removal of water from the rivers reduces the available habitat for fisheries. Runoff from these lands can also carry containments such as fertilizer, herbicides, and pesticides back into the hydrologic system and can degrade fisheries habitat.

Although further development along parts of these rivers and creeks are possible, the impacts from these developments would be incremental over the long-term and no large scale impacts are likely to occur in any foreseeable time frame.

Migratory Birds

Migratory birds occur throughout the CIAA and have been impacted by past and present actions and are expected to continue to be impacted by reasonably foreseeable future actions.

Within the CIAA there has been 2,618,387 acres of land have been converted to urban cities and rural agriculture. In general, this removes native habitat and modifies bird species composition from sagebrush obligate species to more generalist or undesirable species such as brown-headed cowbirds. However, agricultural lands do provide some habitat for migratory birds. For instance, during the growing season, crop lands likely provide some cover for migratory birds (i.e., bobolink) which could be offset by the potential for loss of nests and mortality during harvest. Use by other migratory birds, particularly gulls and raptors, may increase during harvest due to the exposure of rodents and insects. Following harvest of grain crops, use by seed-eating birds, such as the red-winged blackbird and western meadowlark, may also increase due to the seed left from the harvest.

There is little historical data on migratory bird use of habitats in the CIAA. Historically, migratory bird response to past grazing activities was likely similar to their response to current grazing practices, but on a much greater scale due to previously unregulated grazing use. Compaction of soil, removal of plant materials and reduced water infiltration from grazing likely resulted in decreased grasses and forbs and an increase in shrub habitat. This would have modified migratory bird composition and density from species reliant on grasses and forbs decreasing and those species reliant on shrubs increasing.

Historically, fires were a natural part of the ecosystem and likely resulted in some mortality and displacement of migratory birds until habitat was restored. Today wildfire still results in mortality and displacement of migratory birds, but the fire return interval is shorter, fires burn hotter, and are larger than they were historically. This has resulted in a conversion of habitat from native perennial grasses, forbs and shrubs to non-native annual grasses which further influence current fire cycles.

Soils

Rural and urban development (including agriculture) has impacted soils across approximately 2,618,387 acres or about 37% of the CIAA. The majority of the impact has been associated with the removal of natural vegetation, the disruption of natural soil horizons associated with cultivation, and the alteration of soil chemistry through herbicide and fertilizer use.

Wildfire also affects soil stability and increases erosion potential. The increased wildfire intensity has the potential for large scale erosion. With the continual encroachment of cheatgrass and noxious weeds, and wildfire being part of the natural regime cycle, wildfire will be a constant threat to soil stability into the foreseeable future.

Threatened, Endangered, and Sensitive Species

The U.S. Fish and Wildlife Service (USFWS) identified primary and other threats to greater sage-grouse in its 12-Month Findings for Petitions to List the Greater Sage-grouse as Threatened or Endangered (USFWS 2010). The primary cause of sage-grouse population decline identified by the USFWS was fragmentation of sagebrush habitats due to: habitat conversion for agriculture or urbanization, infrastructure within sagebrush habitats (power lines, communication towers, fences, roads, railroads, etc.), wildfire, and energy development (specifically roads and energy related infrastructure). Other important threats included: inadequate regulatory mechanisms, invasive plants (annual grasses and noxious weeds), climate change, collisions (with fence, power lines, etc.), conifer invasion, contaminants, disease (West Nile virus), poorly managed livestock grazing, hunting, mining, predation, prescribed fire/vegetation treatments, recreation (particularly off highway vehicle use) and water developments (USFWS 2010). It is often the cumulative impact of a variety of disturbances that have the greatest effect on sagebrush ecosystems, rather than any single disturbance (Knick et al. 2011).

Wildfire and development (agricultural and urban) provide the greatest cumulative impact to sage-grouse, bald eagles, yellow-billed cuckoos, and grizzly bears within the CIAA. Aside from the direct impacts of habitat alteration, these disturbances may alter species behavior causing them to avoid impacted habitats or displace populations to more suitable areas.

Although livestock grazing was not identified as a primary threat, it is one of the more widespread uses occurring in sage grouse habitat (Connelly et al. 2004). There is limited evidence to suggest there are direct impacts to sage-grouse by livestock, but livestock grazing does directly impact sage-grouse habitats by removing vegetation (forage and cover) or changing species composition under poor management practices (Connelly and Braun 1997).

Recreation use is likely to increase into the foreseeable future. This may result in further habitat fragmentation as unauthorized roads and trails are created. Furthermore, it may increase access for hunters while decreasing security for threatened, endangered, and sensitive species.

Threatened, Endangered, and Sensitive Fish

Within the CIAA there are 1,072 miles of Yellowstone Cutthroat habitat, 94 miles of Bull trout habitat, and 243 miles of whitefish habitat. Traditionally these native species had slight pressure from Native American fishing, but lacked introduced species competing for the same resources.

The increase of recreational activities, introduction of non-native species, and alteration of habitat through the development of canals and reservoirs has placed increased pressures on these species.

Within the CIAA, there are no known further large-scale development along streams and rivers where these species inhabit, although it is likely that recreation use will increase into the foreseeable future.

Vegetation

Of the 7,129,431 acres within the CIAA, 2,618,387 acres or 37% of lands are privately managed. These lands have been heavily altered from their native state into agricultural lands, rural and urban areas. There are grazing allotments designated in 4,192,791 acres within the CIAA. Native vegetation on these lands has been impacted by grazing, wildfires, seeding projects, invasive and noxious plants, and drought cycles.

Over the past 30 years, wildfire has burned 641,833 acres on BLM lands, which amounts to approximately 9% of CIAA. Wildfire can remove and/or permanently alter native vegetation communities. Often, invasive species/noxious weeds are able to establish within fire disturbance areas. Generally, perennial grasses and forbs are able to recover well after wildfire if their composition and health were adequate prior to the fire and fire intensity is not too severe. If shrubs are removed by wildfire, recovery to pre-fire conditions can take much longer.

Approximately 534,053 acres (7% of CIAA) of native habitat have been treated and/or seeded within the CIAA. Some vegetation treatments have been completed in an effort to rehabilitate

and stabilize areas after wildfire and others were completed to improve watershed functionality. Some treatments were completed in the late 1900s with the intent of increasing forage for livestock. Many of the treatment areas have burned or have been treated on multiple occasions. The majority of vegetation treatment areas completed in the CIAA have been seeded in crested wheatgrass, which decreases vegetation species diversity and habitat value to wildlife.

Water Quality (Surface and Ground)

There are 1,325 miles of river within the CIAA of which 819 miles flow through privately held lands. These lands traditionally consisted of native vegetation and the rivers, streams and creeks were unaltered and uncontaminated from urban and rural development. Rivers, streams, and creeks that flow near agricultural fields have a higher potential to acquire degraded runoff which may be contaminated with fertilizers, herbicides and pesticides.

Waters that flow through public lands can be impacted through grazing and wildfire, which removes riparian vegetation and can increase erosion and sedimentation in rivers, streams, and creeks. The removal of vegetative cover can also potentially increase water temperature.

Wetlands and Riparian

Historically wetlands and riparian areas within the CIAA were used by Native Americans and early settlers for water and small crops. Today, many of these areas have been dramatically changed and developed. Springs and seeps have been captured and converted into pipelines, reducing the riparian and wetland footprint. Riparian areas have been impacted through unmonitored grazing practices. Rivers and streams have been channelized to reduce springtime flooding and thus narrow the riparian areas into a defined area.

Wildfire has also impacted 583 miles wetlands and riparian areas. This allows for the establishment of invasive, non-native species such as Canadian Thistle. Development of wetlands and riparian areas may continue on privately managed lands and can result in further impacts.

Wildlife Resources

Historically, big game species in the CIAA were used by Native Americans and early settlers as food and for their fur, teeth, bones and antlers or horns. Today big game is economically important for tourism, hunting, and for their meat and other products. The construction of 6,184 miles of fences has changed movement patterns, but three and four strand fences are considered negotiable by big game. Fences provide perches for resident bird species that increases their visibility to their predators, but also provides increased visibility for territorial displays, singing perches and foraging points.

Agriculture, particularly alfalfa fields and haystacks, in the CIAA provide forage to big game during the winter and other times of the year. Agriculture also provides cover and increased forage for small mammal prey for raptors such as rabbits, marmots, and mice.

Historically, the CIAA provided intact sagebrush steppe habitat for wildlife. Currently, 18,305 miles of roads and trails and 550 miles of high-power lines fragment the CIAA. Habitat fragmentation creates landscapes of altered habitats fundamentally different from those created by natural disturbances such as changes in vegetation composition, increased edges, and reduced forage quality and security. These roads and trails also provide an increase in recreational opportunities which may disturb wildlife during critical seasons of the year or result in wildlife avoiding previously important areas such as fawning or nesting grounds.

There is little historical information on the other wildlife species such as resident bird, reptile and small mammal species found in the CIAA. Changes in vegetation composition and structure ultimately results in a change in wildlife species abundance and diversity moving from species specialized for a certain habitat type to more generalist species.

Recreation use is likely to increase into the foreseeable future. This may result in further habitat fragmentation as unauthorized roads and trails are created. Furthermore, it may increase access for hunters, while decreasing security for game species.

Incremental Effects of the Proposed Action and No Action Alternatives

The objective of this section of the document is to disclose the differing impacts that each alternative would incrementally add to or subtract from the total effect of past, present, and reasonably foreseeable actions discussed in the prior sections. As indicated in Table 20, the implementation of the various alternatives would affect the current condition of the CIAA in different ways.

Table 20: Incremental Effects of the Alternatives

Resource	Alternative A – The Proposed Action	Alternative B – Nonnative Seeding	Alternative C – No Action
Air Quality	Soil disturbing activities associated with the Proposed Action may affect air quality through increased fugitive dust. Any increases are expected to be negligible, localized, and temporary and would not add to the cumulative impacts within the CIAA.	The incremental effect of Alternative B would be the same as described for Alternative A.	There would be no measurable contribution to airshed-scale cumulative effects from the no action alternative. However, without the implementation of treatments focused on improving the sagebrush steppe, PM10, PM 2.5 and smoke emissions could contribute to the deterioration of the airshed under a wildfire scenario.
Cultural Resources	The Proposed Action would improve existing steppe and shrubland habitat, and also reduce the potential for future ground disturbance (direct impacts to cultural resources) as the result of wildland fire (e.g., fire suppression). All eligible or potentially eligible cultural resources would be avoided during treatment activities, and resource integrity would remain intact. These types of project Design Features can protect historic properties on public lands, whereas cultural resources located on private lands have not and will not be subject to Section 106 review, and have the potential to be altered or damaged through agricultural and infrastructure development.	The incremental effect of Alternative B would be the same as described for Alternative A.	Foregoing treatments could add to the accumulated detrimental effect because annual grasses and associated wildfires have the potential to damage or destroy cultural resources and the loss of perennial cover could lead to the exposure (through erosion) and subsequent damage and/or unlawful removal of cultural resources from the site.
Economic and Social Values	The Proposed Action may result in some short-term financial impacts to operators which may trickle down to businesses frequently used by those operators. However, these vegetative treatments will improve grass and forb productivity and health providing more forage for livestock, thereby cumulatively improving the vegetative condition of the allotments within the project area.	The incremental effect of Alternative B would be the same as described for Alternative A.	The No Action alternative would result in no measurable impacts to the livestock operators within or adjacent to the treatment areas. However, by not improving the vegetative condition within these treatment areas operators could experience further declines in forage quantity and quality which may reduce the allotments carrying capacity in the long-term.
Invasive, Non-native Species	The Proposed Action would result in ground disturbance and slight short-term impacts in residential vegetative populations. There could be an increase in invasive species populations due to current infestations found within and	The incremental effect of Alternative B would be the same as described for Alternative A.	Taking no action has the potential for existing conditions, favorable for substantial weed infestations, to continue. Resulting in the potential for large-scale noxious weed infestations.

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Resource	Alternative A – The Proposed Action	Alternative B – Nonnative Seeding	Alternative C – No Action
	adjacent to the project area. Treatment of weeds and restoration of disturbed areas would help reduce the spread of invasive, non-native species throughout the CIAA.		
Migratory Birds	The Proposed Action would result in changes in vegetation composition, structure and productivity across various landscapes. These lands could become productive habitat for migratory birds quicker than lands not treated under the Proposed Action.	The incremental effect of Alternative B would be the same as described for Alternative A.	Taking no action would potentially result in large areas of land impacted by wildfire and other detrimental impacts remaining in a degraded state. Limiting nesting habitat for Migratory birds.
Range Resources	Vegetative treatments will improve grass and forb productivity and health providing more forage for livestock, thereby cumulatively improving the vegetative condition of the allotments within the project area.	The incremental effect of Alternative B would be the same as described for Alternative A.	The No Action alternative would continue to limit the carrying capacity of the previously identified allotments. Additionally, annual grasses would continue to dominate portions of the project area which could potentially promote uncharacteristic wildfire and lead to short-term losses of AUMs and further expansion of cheatgrass within the CIAA.
Soils	Initial seeding would break up soil strata allowing for greater erosion potential, especially through the use of drag harrows. Long term effects would be the establishment of native grasses, forbs and shrubs, resulting in decreased soil erosion, increased stability, and enhance nutrients in the topsoil.	The incremental effect of Alternative B would be the same as described for Alternative A.	Degraded areas with little cover would be susceptible to erosion and slopes could remain unstable.
Threatened, Endangered, and Sensitive Animals	Areas treated under the Proposed Action could develop ecologically healthy habitats quicker than untreated areas. These treated areas would increase potential nesting and brood rearing habitat and reduce impacts resulting from invasive species and wildfire.	The incremental effect of Alternative B would be the same as described for Alternative A.	Taking no action would potentially result in large areas of land impacted by wildfire and other detrimental impacts remaining in a degraded state. Limiting nesting habitat for threatened, endangered, and sensitive animals.
Tribal Treaty Rights and Interests	The Proposed Action would result in changes to species diversity, reduced abundance of cheatgrass, and the temporally displacement of wildlife during treatment activities. These actions would lead to a reduction in the reoccurrence and size of wildfires, which would increase the quantity and diversity of vegetative species and wildlife species used by the Tribes.	The incremental effect of Alternative B would be the same as described for Alternative A.	The No Action alternative has the potential to lead further deterioration of the native plant communities due to the continued expansion of annual grasses such as cheatgrass and the heightened potential for uncharacteristic wildfire. This could result in further decreases in the availability of plant and animal species customarily hunted and gathered by the Tribes.

Upper Snake Sagebrush Steppe Restoration Project
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Resource	Alternative A – The Proposed Action	Alternative B – Nonnative Seeding	Alternative C – No Action
Vegetation	Effects of the Proposed Action in combination with past, present, and reasonably foreseeable future actions would result in an improvement in vegetative conditions and shrub habitat. In the long term, areas which currently are degraded and lacking shrub cover could recover to historical percentages. Other actions would contribute a negligible amount to cumulative effects to this resource.	The incremental effect of Alternative B would be similar to those described for Alternative A with the exception of the use of nonnative species within the seed mix. This would add less favorable perennial bunchgrasses to the area and would result in changes in vegetation composition, structure and productivity. Conversely, the establishment of perennial bunchgrass, albeit nonnative, would aid in the stabilization of the site and help to reduce the size and extent of future wildfires, thus allowing for the future recolonization of the site by native vegetation.	Under the No Action Alternative, areas currently degraded would take longer to re-establish shrub cover, if shrub cover is able to recover. Degraded areas will be susceptible to invasion by non-native species and noxious weeds.
Wildlife	<p>The Proposed Action would result in short-term displacement of wildlife during planting. In the foreseeable future, treated areas would improve due to increases in native herbaceous and shrub cover resulting in more habitat and cover for wildlife.</p> <p>Treated areas could also potentially become more susceptible to large-scale wildfire as shrub densities increase.</p>	The incremental effect of Alternative B would be the same as described for Alternative A.	Traditional wildlife habitat would remain in a degraded state and the displacement of wildlife into other areas could continue to occur.

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CHAPTER 5 – CONSULTATION AND COORDINATION

Persons and Agencies Contacted

Persons / Agency	Organization
Natural Resource Conservation Service	Federal Government
Idaho Department of Lands	State Government
Idaho Conservation League	Non-governmental Organization
Idaho Department of Fish and Game – Region 5	State Government
Idaho Department of Fish and Game – Region 6	State Government
Greater Yellowstone Collation	Non-governmental Organization
Western Watersheds Project	Non-governmental Organization
Wildlands Defense	Non-governmental Organization
Idaho State Dept. of Agriculture	State Government
U.S. Department of Energy - INL	Federal Government
Chairman, Land Use Policy Committee, Shoshone-Bannock Tribes	Shoshone-Bannock Tribe
Todd Mickelson	Permittee
Phillips Brothers Farm and Livestock	Permittee
Matthew Phillips	Permittee
John Phillips	Permittee
Denis Kowitz	Permittee
John Basterrechea	Permittee
Mariana Basterrechea	Permittee
Ball Brothers Sheep	Permittee
Etcheverry Sheep Company	Permittee
Sid Butte Livestock, Inc.	Permittee
Mark Ure	Permittee
Stanley Bingham	Permittee
Ken Wixom	Permittee
Secrest Sheep and Cattle	Permittee
Forrest Arthur	Permittee
Utopia Land and Livestock	Permittee

C.W. & S.W. Lundholm	Permittee
Bill Coon	Permittee
Glen Dalling	Permittee
Harvey Walker	Permittee
Jeff Siddoway	Permittee
Ward Johnson	Permittee
Table Butte Cattle Company	Permittee
Egan Land and Cattle LLC	Permittee
Wulf Lebrecht	Permittee
Royd Haroldsen	Permittee
David Dalling	Permittee
Siddoway Sheep Company	Permittee
John Siddoway	Permittee
Circle J.B., Inc.	Permittee
William P. Phillips and Son	Permittee
Murdoch's Diamond-4 Ranch	Permittee
Samuel & Patrick McGarry	Permittee

List of Preparers

Ben Dyer.....	<i>Fire Ecologist</i>	Project Lead; Vegetation; Air Quality; Tribal Treaty Rights, Economic and Social Values
Justin Frye.....	<i>Wildlife Biologist</i>	Wildlife; Threatened, Endangered and Sensitive Animal Species; Migratory Birds
Marissa Guenther...	<i>Archaeologist</i>	Cultural, NEPA Review
Bret Herres.....	<i>RMS</i>	Range Resources
Scott Minnie	<i>RMS/Weed Specialist</i>	Invasive, Non-native Species
Brandy Janzen.....	<i>Soils Specialist</i>	Soils

REFERENCES CITED

- Asay, K.H., W.H. Horton, K.B. Jensen, and A.J. Palazzo. 2001. Merits of native and introduced Triticeae grasses on semiarid rangelands. *Canadian Journal of Plant Science* 81: 45-52.
- Big Desert Sage-Grouse Local Working Group. 2010. Sage-grouse Conservation Plan-Big Desert Sage-Grouse Planning Area.
- Bechard, M.J. and J.K. Schmutz. 1995. Ferruginous Hawk (*Buteo regalis*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/172>
- Buenger, B. 2003. The Impact of Wildland and Prescribed Fire on Archaeological Resources. Unpublished PhD Dissertation, Department of Anthropology, University of Kansas.
- Cade, T.J. and C.P. Woods. 1997. Changes in distribution and abundance of the loggerhead shrike. *Conservation Biology*. 11: 21-31
- Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. *Ecological Systems of the United States: A Working Classification of U.S. Terrestrial Systems*. NatureServe, Arlington, Virginia. Available online at: <http://www.natureserve.org/publications/usEcologicalsystems.jsp>
- Connelly, J.W., M.A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. *Wildlife Society Bulletin* 28: 967- 985.
- Connelly, J.W., S.T. Knick, M.A. Schroeder, and S. J. Stiver. 2004. Conservation Assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies, Cheyenne, Wyoming, USA.
- Crawford, J.A., R.A. Olson, N.E. West, J.C. Mosley, M.A. Schroeder, T.D. Whitson, R.F. Miller, M.A. Gregg, and C.S. Boyd. 2004. Ecology and management of sage-grouse and sage-grouse habitat. *Journal of Range Management* 57: 2-19.
- Deal, K. 2002. Effects of Prescribed Fire on Obsidian and Implications for Reconstructing Past Landscape Conditions. In *The Effects of Fire and Heat on Obsidian*, edited by J.M. Loyd, T.M. Origer, and D.A. Fredrickson, pp.5-10. Cultural Resources Publication, Papers presented in Symposium 2, The Effects of Fire/Heat on Obsidian at the Annual Meeting of the Society for California Archaeology, April 23-25, 1999, Sacramento, California.
- Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, M.P. Nenneman, A.L. Zimmerman, and B.R. Euliss. 1998 (revised 2002). Effects of management practices on

grassland birds: Loggerhead Shrike. Northern Prairie Wildlife Research Center, Jamestown, ND. 19 pp.

Dobbs, R.C., P.R. Martin, and T.E. Martin. 2012. Green-tailed Towhee (*Pipilo chlorurus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/368>

DOI-BLM. 1981. *Big Desert Management Framework Plan*. Idaho Falls District Office, Idaho Falls, Idaho.

DOI-BLM. 1985. *Medicine Lodge Resource Management Plan*. Idaho Falls District Office, Idaho Falls, Idaho.

DOI-BLM. 1996. Sampling Vegetation Attributes Interagency Technical Reference.

DOI-BLM. 2007. Vegetation Treatments Using Herbicides on Bureau of Land Management Land Lands in 17 Western States Programmatic Environmental Impact Statement.

DOI-BLM. 2008. Fire, Fuels, and Related Vegetation Management Direction Plan Amendment and Final Environmental Impact Statement and Record of Decision.

DOI-BLM. 2009. Upper Snake-Pocatello Integrated Weeds Control Programmatic Environmental Assessment. EA#ID-310-2008-EA-43.

DOI-BLM. IM-2009-039. The Special Status Species Management Manual (47 pp). Washington, D.C.

DOI-BLM. IM-2012-043. Greater Sage-grouse Interim Management Policies and Procedures. Washington, DC.

DOI-BLM. IM-2013-128. Sage-grouse Conservation in Fire Operations and Fuels Management. Washington, D.C.

DOI-BLM. IM-2015-009. Idaho Bureau of Land Management (BLM) Special Status Species List Update. (18 pp).

DOI-BLM and USDA-USFS. 2015. Idaho and Southwestern Montana Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement.

Duke, P., D. Cave, and R. Kimmick. 2003. The Effects of Fire on Cultural Resources. Department of Anthropology, Fort Lewis College, Durango, Colorado submitted to the San Juan National Forest, Colorado. January 2003.

http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/coop_agencies/cr_publications.Par.21987.File.dat/NoncopyrightMaterial/Duke_etal2003.pdf.

Fellers, G.M., and E.D. Pierson. 2002. Habitat use and foraging behavior of Townsend's big-eared bat (*Corynorhinus townsendii*) in coastal California. *Journal of Mammalogy* 83:167-177.

FIREMON. 2004. Fire Effects Monitoring and Inventory System.

FFI. 2012. FEAT/FIREMON Integrated Monitoring Application.

Gruver, J.C. and D.A. Keinath (2006, October 25). Townsend's Big-eared Bat (*Corynorhinus townsendii*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available:

<http://www.fs.fed.us/r2/projects/scp/assessments/townsendbiggearedbat.pdf>

Hann, W.J. and D.L. Bunnell. 2001. Fire and land management planning and implementation across multiple scales. *International Journal of Wildland Fire*. 10:389-403.

Hardy, C.C., K.M. Schmidt, J.M. Menakis, and N. R. Sampson. 2001. Spatial data for national fire planning and fuel management. *International Journal of Wildland Fire*. 10:353-372.

Harp, A.J., R. Loucks, and J. Hawkins. 2000. Spatial Distribution of Economic Change from Idaho Ranches. *Journal of Range Management*. 53(2) pgs 164-169.

Hoskins, L. W., and P. D. Dalke. 1955. Winter browse on the Pocatello Big Game Range in southeastern Idaho. *The Journal of Wildlife Management* 19(2): 215-225.

IDFG 2005. Idaho Department of Fish and Game. Idaho Comprehensive Wildlife Conservation Strategy. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. <http://fishandgame.idaho.gov/cms/tech/CDC/cwcs.cfm>

Idaho Sage-grouse Advisory Committee. 2006. Conservation Plan for the Greater Sage-grouse in Idaho.

Idaho Sage-grouse Advisory Committee. 2015. Idaho Sage-Grouse Local Working Groups Statewide Annual Report 2014.

Janson, R.G. 2002. The pygmy rabbit from Utah to Montana. Montana Cooperative Wildlife Research Unit, University of Montana. Missoula MT. 41 pp.

Johnson, M.J., C. Van Riper, III and K.M. Pearson. 2002. Black-throated Sparrow (*Amphispiza bilineata*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of

Ornithology; Retrieved from the Birds of North America Online:

<http://bna.birds.cornell.edu/bna/species/637>

Kochert, M.N., K. Steenhof, C.L. McIntyre and E.H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:

<http://bna.birds.cornell.edu/bna/species/684>

LANDFIRE 2007. LANDFIRE National Vegetation Dynamics Models. (2007, January). [Homepage of the LANDFIRE Project, U.S. Department of Agriculture, Forest Service; U.S. Department of Interior], [Online]. Available: <http://www.landfire.gov/index/php> [2014, January 9].

Loyd, J.M. et al. 2002. In The Effects of Fire and Heat on Obsidian. Bureau of Land Management, Cultural Resources Publication, Bishop Field Office, California.

Makela, P. and D. Major. 2011. A framework to identify Greater sage-grouse priority areas and general areas in Management Zone IV and the Bear Lake Plateau of Southeastern Idaho. Available (3/1/2012) at:

http://www.blm.gov/pgdata/etc/medialib/blm/id/wildlife/sensitive_species/sagegrouse_habitat.Pa_r.90238.File.dat/Idaho_Sage-grouse_Priority_Areas_White_Paper_Final_April_26_2012_508.pdf

Martin, John W. and Barbara A. Carlson. 1998. Sage Sparrow (*Artemisiospiza belli*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/326>

Poulin, R.L., D. Todd, E.A. Haug, B.A. Millsap and M.S. Martell. 2011. Burrowing Owl (*Athene cunicularia*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:

<http://bna.birds.cornell.edu/bna/species/061>

Reynolds, T.D. and T.D. Rich. 1978. Reproductive ecology of the Sage Thrasher (*Oreoscoptes montanus*) on the Snake River Plain in south-central Idaho. Auk 95:580-582.

Reynolds, T.D., T.D. Rich and D.A. Stephens. 1999. Sage Thrasher (*Oreoscoptes montanus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/463>

Rickart, E.A. 1987. *Spermophilus townsendii* in Mammalian Species. The American Society of Mammalogists. No. 268 pp. 1-6.

Rotenberry, J.T., M.A. Patten and K.L. Preston. 1999. Brewer's Sparrow (*Spizella breweri*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/390>

Rowe, H.I., and E.T. Bartlett. 2001. Development and federal grazing policy impacts on two Colorado counties: a comparative study. In: L.A. Torell, E.T. Bartlett, and R. Larranaga (eds.). Current issues in rangeland resource economics: Proc. of a symposium sponsored by Western Coordinating Committee 55 (WCC-55), N.M. State Univ., Res. Rep. 737, Las Cruces, N.M.

Sands, A.R., Sather-Blair, S., & Saab, V. 1999. Sagebrush steppe wildlife: historical and current perspectives. In P.G. Entwistle, A.M. DeBolt, J.H. Kaltenecker, and K. Steenhof [compilers]. Proceedings of the Sagebrush Steppe Ecosystems Symposium in Boise, Idaho (pp. 27-35).

Sawyer, H., R.M. Nielson, F.G. Lindzey, L. Keith, J.H. Powell, and A.A. Aabraham. 2007. Habitat Selection of Rocky Mountain Elk in a Nonforested Environment. The Journal of Wildlife Management, 71: 868–874.

Schmidt, K.M., J.P. Menakis, C.C. Hardy, W.J. Hann, and D.L. Bunnell. 2002. Development of coarsescale spatial data for wildland fire and fuel management. Gen. Tech. Rep. RMRS-GTR-87. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Shackley, M., S. Dillian, and C. Dillian. 2002. Thermal and Environmental Effects on Obsidian Geochemistry: Experimental and Archaeological Evidence. In The Effects of Fire and Heat on Obsidian. J.M. Loyd, T.M. Origer, and D.A. Fredrickson, editors. Bureau of Land Management, Cultural Resources Publication, Bishop Field Office, California.

Solomon, M. 2002. Fire and Glass: Effects of Fire on Obsidian Hydration Bands. In The Effects of Fire and Heat on Obsidian. J.M. Loyd, T.M. Origer, and D.A. Fredrickson, editors. Bureau of Land Management, Cultural Resources Publication, Bishop Field Office, California.

Stevens, B.S., K.P. Reese, J.W. Connelly, and D.D. Musil. 2012. Greater sage-grouse and fences: does marking reduce collisions? Wildlife Society Bulletin 36(2):297-303.

Stiver, S.J., E.T. Rinkes, and D.E. Naugle. 2010. Sage-grouse Habitat Assessment Framework. U.S. Bureau of Land Management. Unpublished Report. U.S. Bureau of Land Management, Idaho State Office, Boise, Idaho.

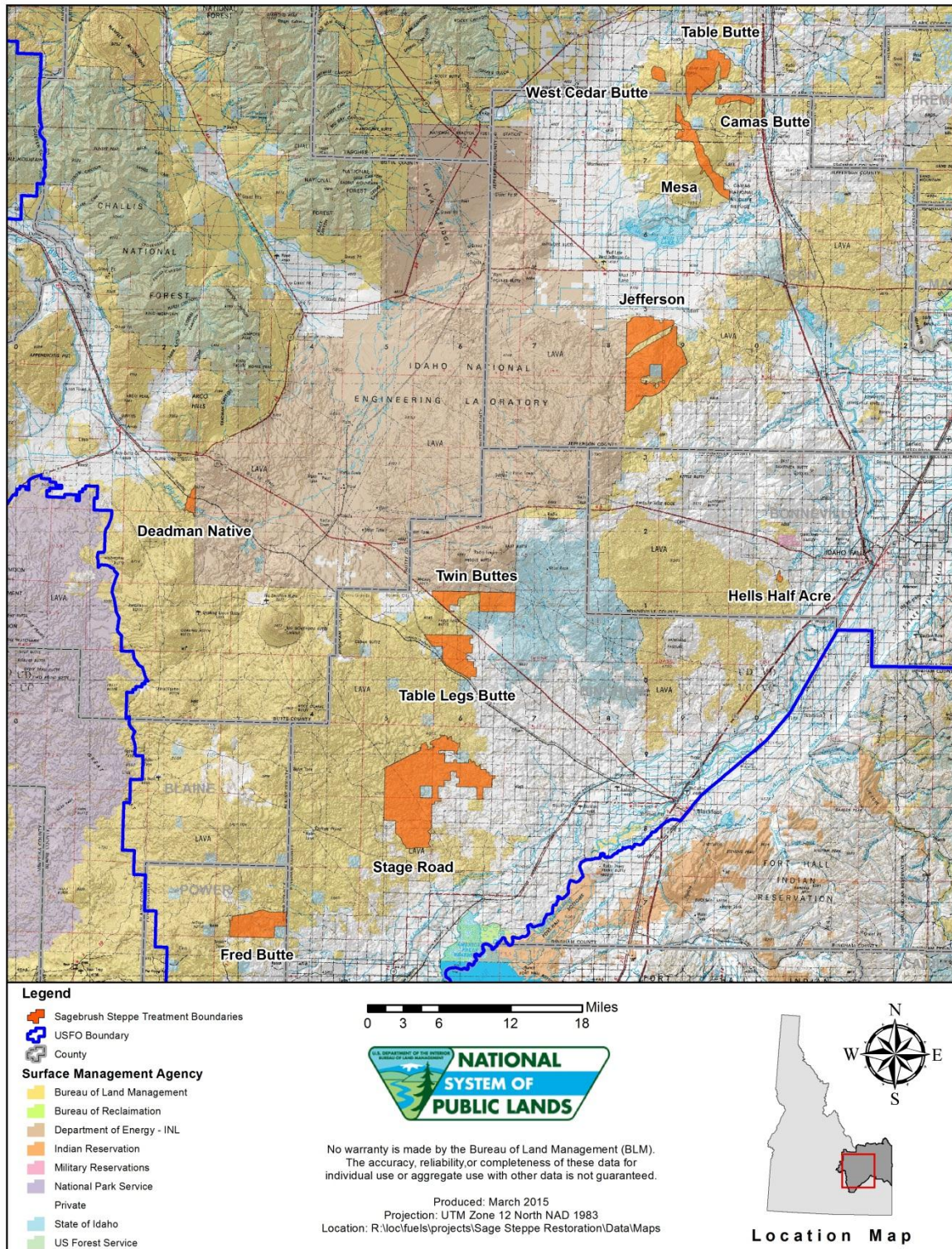
Upper Snake Sage-grouse Local Working Group. 2009. Plan for Increasing Sage-grouse Populations Plan-Upper Snake Sage-grouse Planning Area.

USDA-NRCS. 2003. Ecological Site Information System. <http://esis.sc.egov.usda.gov/ESIS/>

- USDA-NRCS. 2008a. Soil Survey of Bingham County Area, Idaho.
- USDA-NRCS. 2008b. Soil Survey of Bonneville County Area, Idaho.
- USDA-NRCS. 2008c. Soil Survey of Jefferson County Area, Idaho.
- USDA-NRCS. 2008d. Soil Survey of Power County Area, Idaho.
- USDA-NRCS. 2009. Soil Survey of Butte County Area, Idaho, Parts of Butte and Bingham Counties.
- U.S. Fish and Wildlife Service (USFWS). 2010. Endangered and threatened wildlife and plants: 12-Month findings for petitions to list the greater sage-grouse (*Centrocercus urophasianus*) as threatened or endangered. 75 FR 55. March 23. pp. 13910-13014.
- Vander Haegen, M. 2003. Sage Sparrow 33-1 – 33-4 in E. Larsen, J. M. Azerrad, N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds. Washington Department of Fish and Wildlife, Olympia, Washington, USA.
- Vickery, P.D. 1996. Grasshopper Sparrow (*Ammodramus savannarum*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/239>
- Walker, B. 2004. Effects of management practices on grassland birds: Brewer's Sparrow. Northern Prairie Wildlife Research Center, Jamestown, ND. Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/resource/literatr/grasbird/brsp/brsp.htm> (Version 12 AUG 2004).
- Wiggins, D.A., D.W. Holt, and S.M. Leasure. 2006. Short-eared Owl (*Asio flammeus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/062>
- Winthers, E. , Fallon, D. , Haglund, J. , DeMeo, T. , Tart, D. , Ferwerda, M. , Robertson, G. Gallegos, A. , Rorick, A. , Cleland, D. T. , Robbie, W. and Shadis, D. , 2004. Terrestrial Ecological Unit Inventory Technical Guide. USDA Forest Service, Washington Office – Ecosystem Management Coordination Staff, 125 pp.
- Winthrop, K. 2004. Bare Bones Guide to Fire Effects on Cultural Resources, Bureau of Land Management, WO-240.
<http://www.blm.gov/heritage/Fire%20Effects%20on%20Cultural%20Resources.htm>
- Woods, C.P. and T.J. Cade. 1996. Nesting habits of the loggerhead shrike in sagebrush. The Condor 98:75-81.

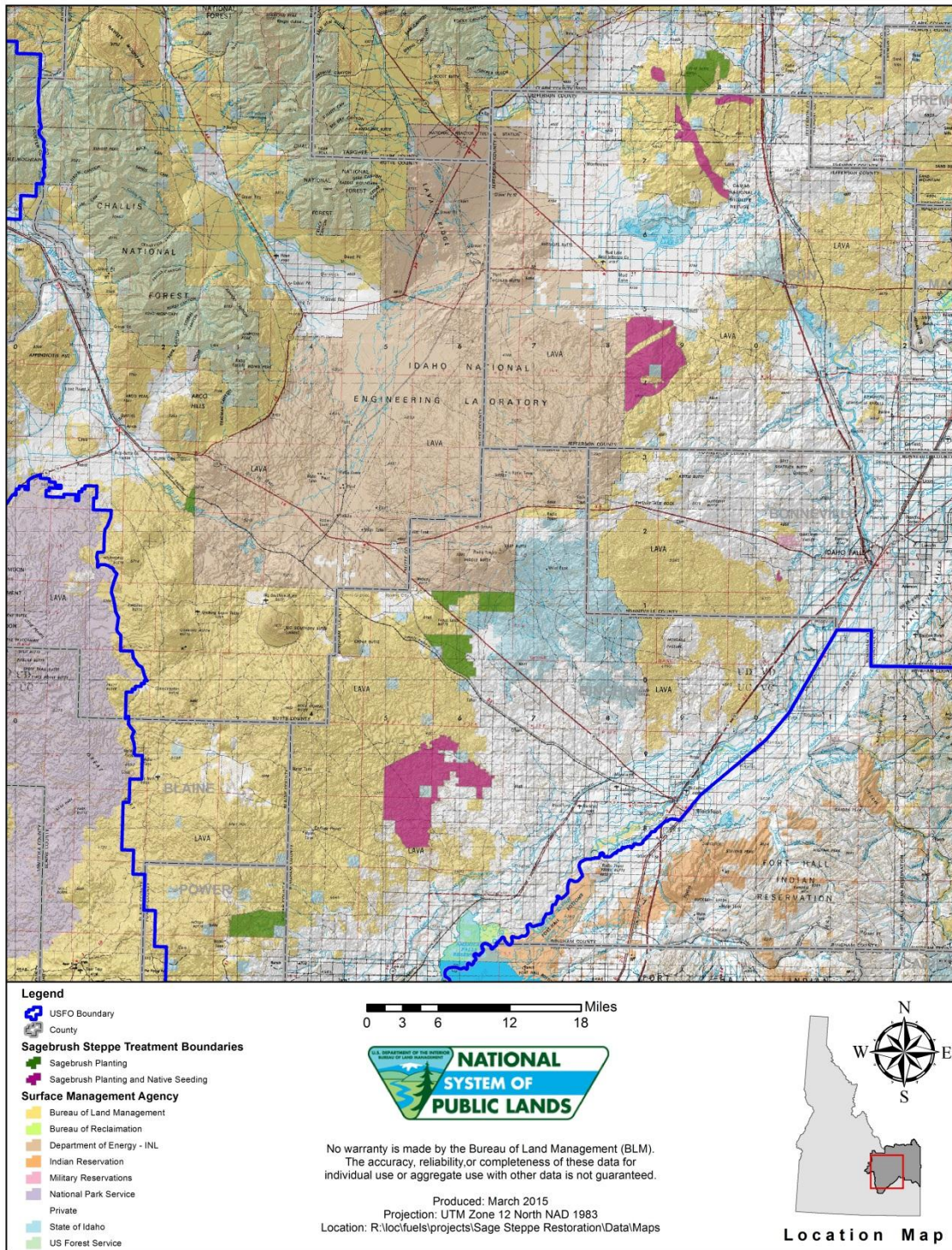
APPENDIX A : MAPS

Map 1: Upper Snake Sagebrush Steppe Restoration Project Area.

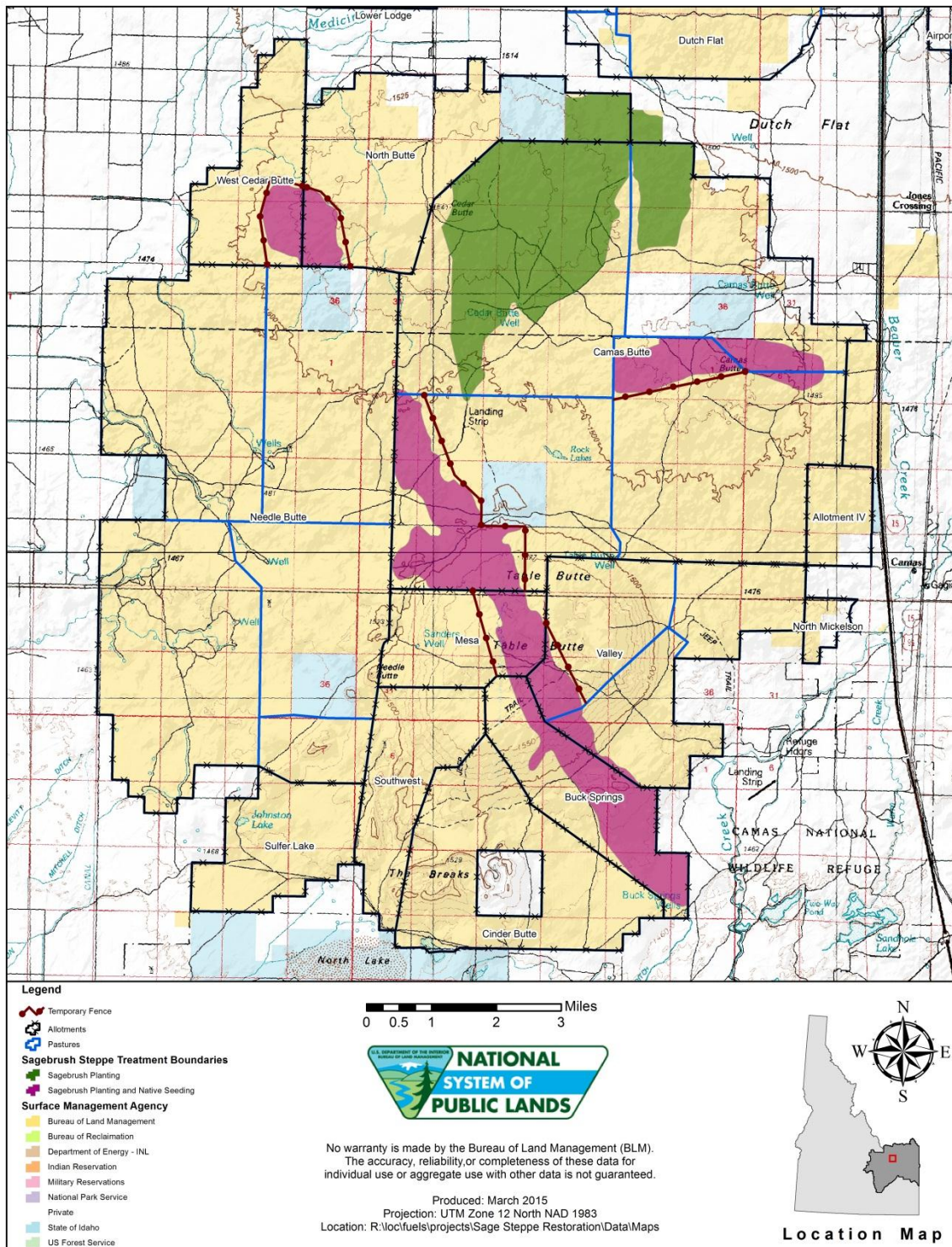


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Map 2: Upper Snake Sagebrush Steppe Restoration Treatment Units Alternative A (Proposed Action).

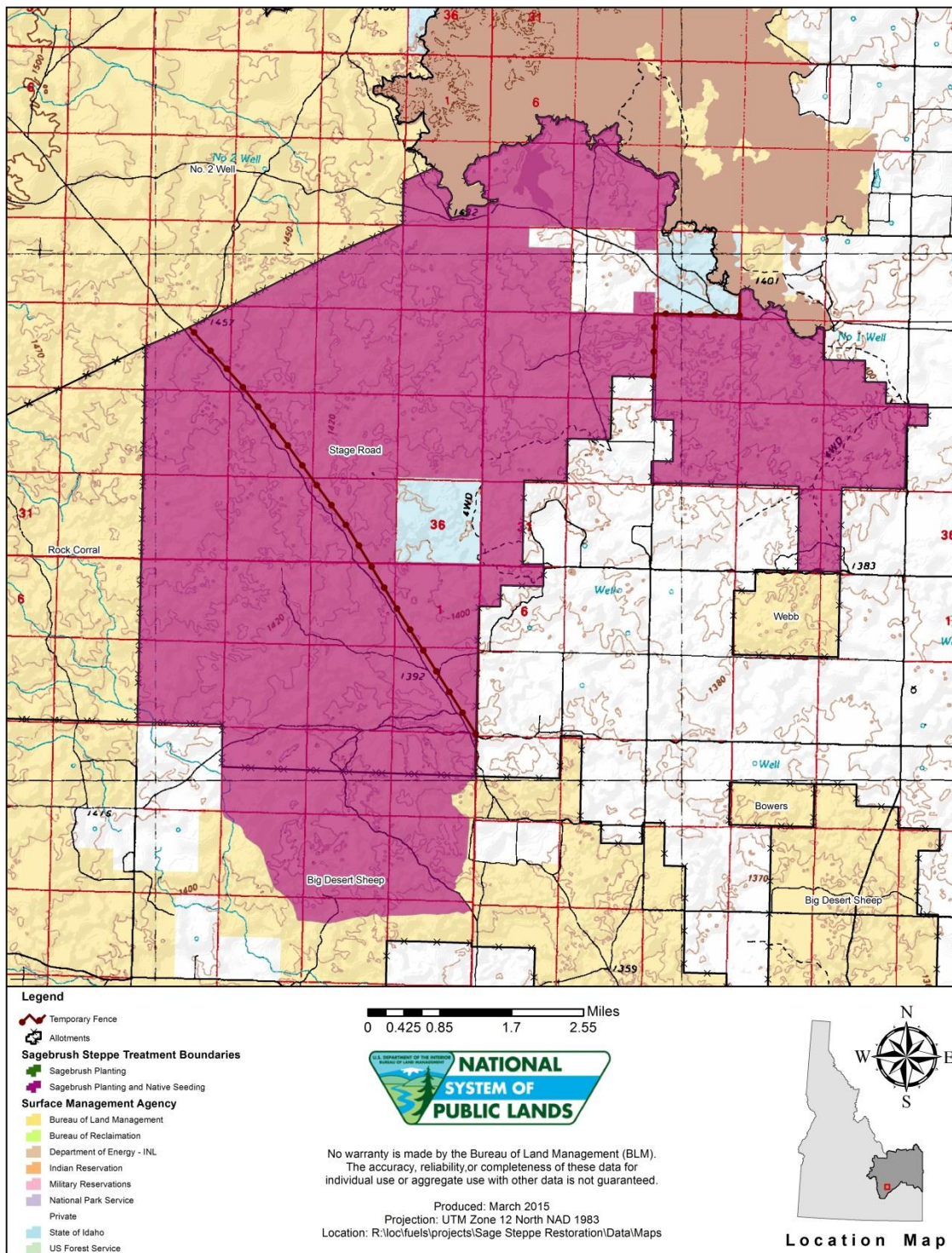


Map 3: Proposed Temporary Fence Locations Under Alternative A (Camas Butte Area).

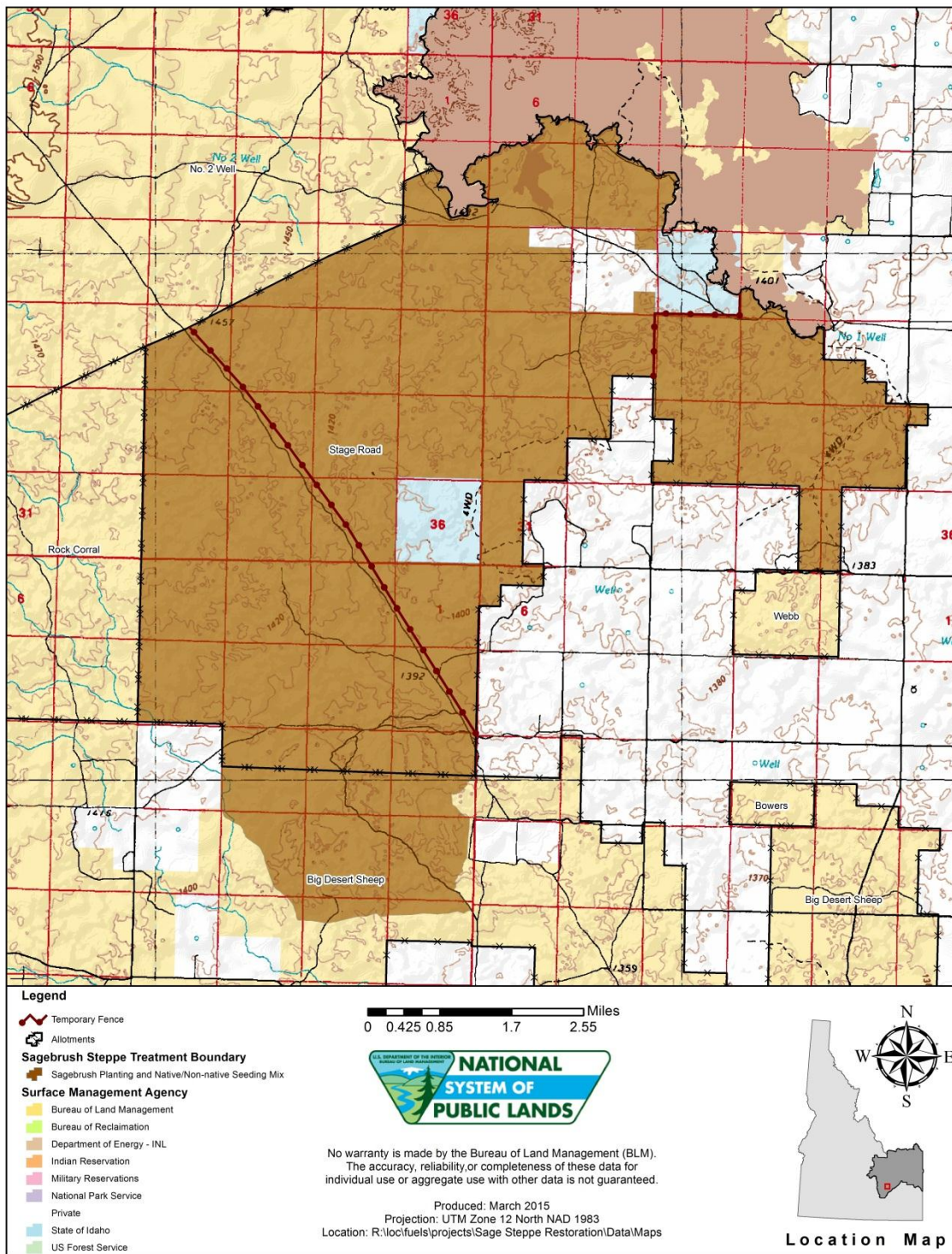


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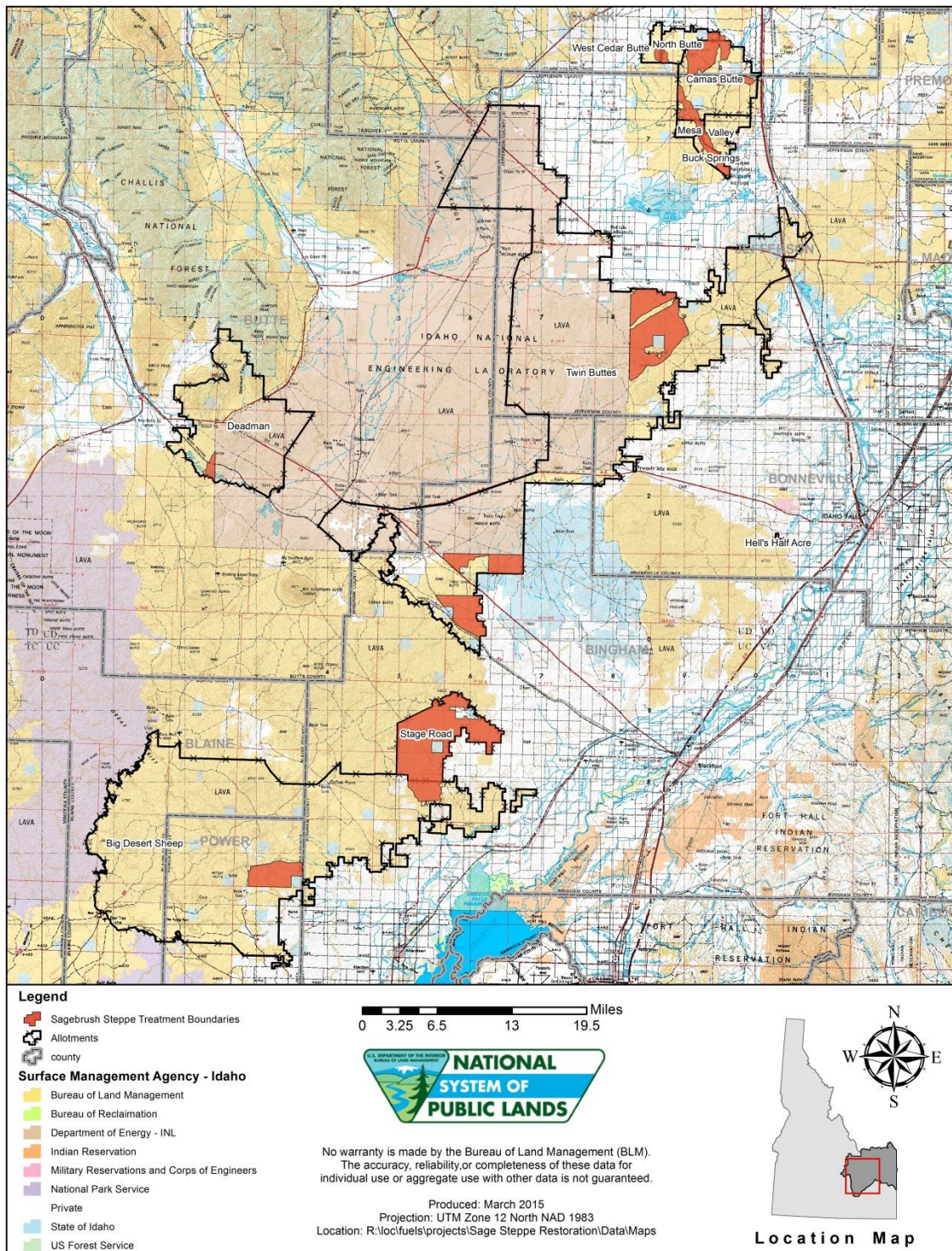
Map 4: Proposed Temporary Fence Locations Under Alternative A Continued (Stage Road Unit).



Map 5: Upper Snake Sagebrush Steppe Restoration Treatment Unit Alternative B (Non-native Seeding Alternative) with Temporary Fence Locations.

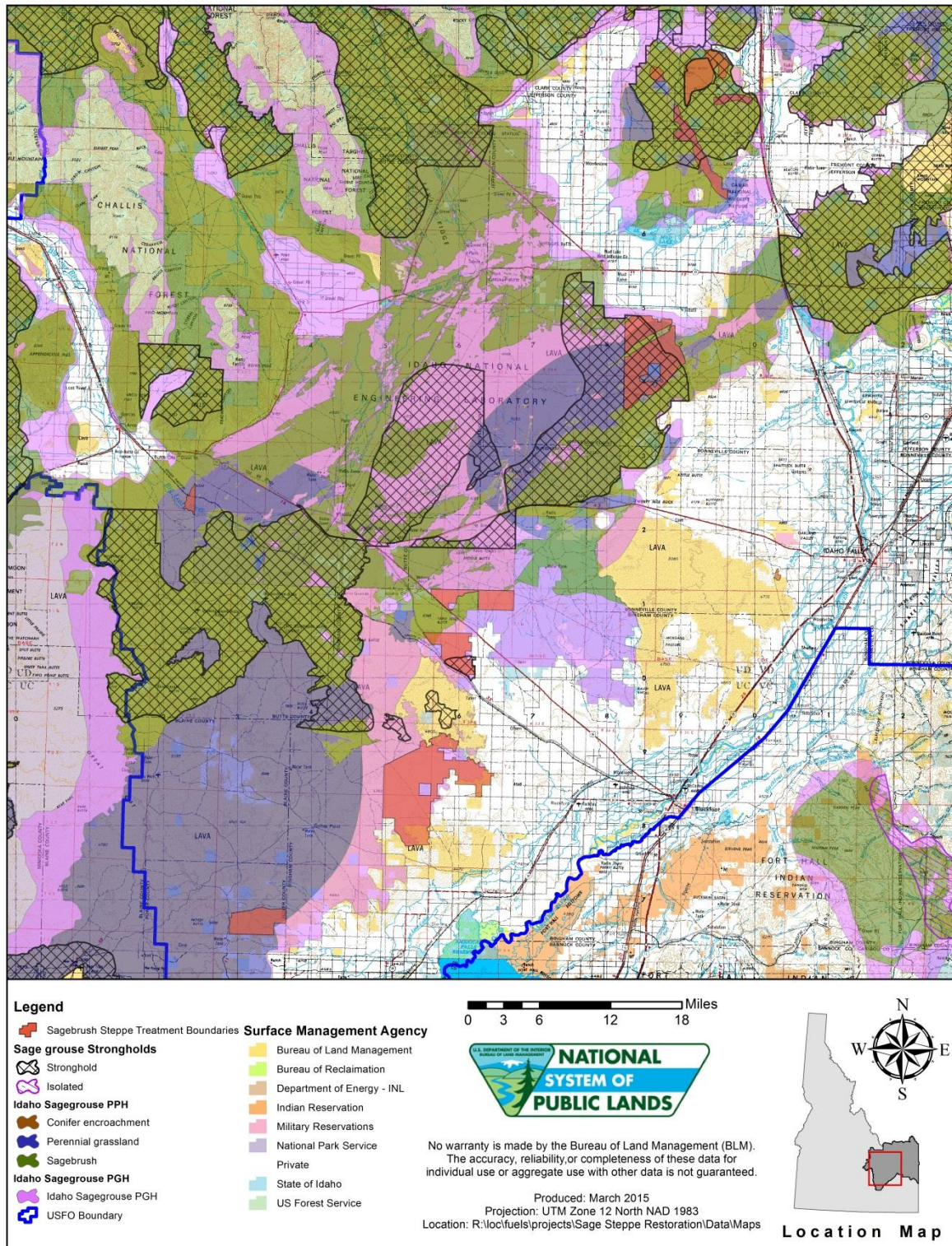


Map 6: Treatment Units and Associated Livestock Grazing Allotments.



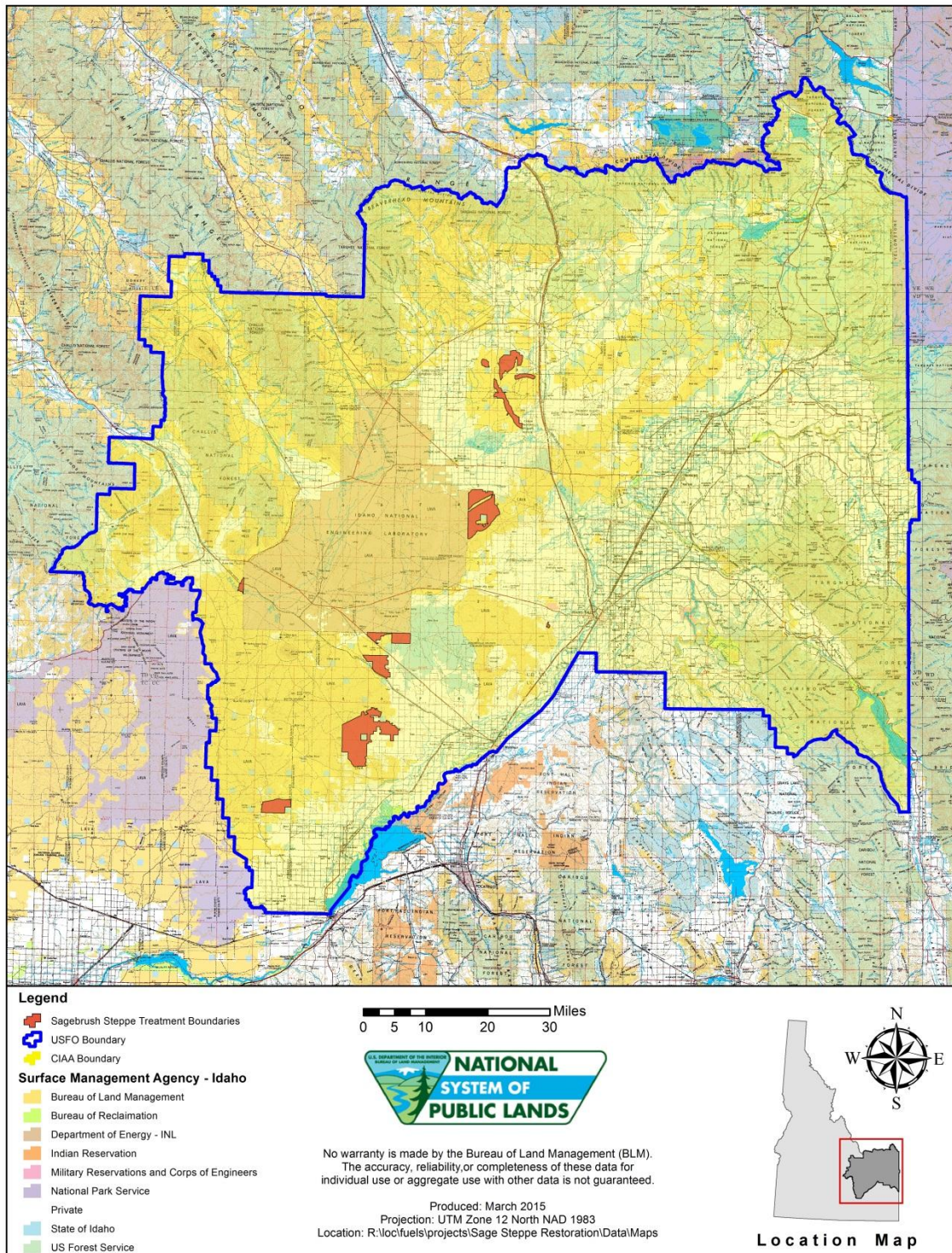
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Map 7: Greater Sage-grouse Focal Areas and Strongholds.



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Map 8: Upper Snake Sagebrush Steppe Restoration Project Cumulative Impact Assessment Area (CIAA).



APPENDIX B – FRCC METHODOLOGY AND ANALYSIS

Fire Regime Condition Class (FRCC) is the classification of a project area (a landscape) into three categories based on the amount of departure from 1) the natural fire regime (historic wildland fire frequency, severity), and 2) the natural vegetation composition, structure, and pattern resulting from a natural fire regime (Hann and Bunnell 2001). The three fire regime condition classes are based on no or low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the reference conditions (Hann and Bunnell 2001; Hardy et al. 2001; Schmidt et al. 2002). Departure in the natural fire regime can result in changes to one (or more) of the following ecological components and processes such as vegetation characteristics (species composition, structural stage, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances, such as insect and disease mortality, grazing, and drought. Possible causes of this departure include (but are not limited to) fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, and introduced insects and disease (Schmidt et al. 2002). Both the departure from a natural fire regime and the resulting departure from the natural vegetation composition, structure, and pattern can be graphed (regime on the x-axis, vegetation on the y-axis), and an overall FRCC rating for each biophysical setting (BpS) within a landscape assigned.

General descriptions of each FRCC rating are as follows:

- FRCC I (0-33% departure) describes an area that is within the historical range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances. Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime.
- An FRCC II (34-66% departure) represents a moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances. Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate.
- An FRCC III (67-100% departure) is defined as having high departure from the natural/historical fire regime – vegetation composition, structure, and fuels have high departure from the historical regime and predispose the system to high risk

of loss of key ecosystem components. Wildland fires are highly uncharacteristic compared to the historical fire regime behaviors, severity, and patterns. Disturbance agents, native species habitats, and hydrologic functions are substantially outside the historical range of variability.

In order to determine departure and assign FRCC, reference condition characteristics are needed so that a comparison with current conditions can occur. As part of the national-scale LANDFIRE project (see <http://www.landfire.gov>) reference condition characteristics have been identified and descriptions developed for the western U.S., eastern U.S., and Alaska concerning vegetation-fuel class composition, fire frequency, and fire severity for BpS. Biophysical settings are the primary environmental settings used in determining a landscape's natural fire regime(s) and FRCC. These settings incorporate both classification (taxonomic) and map unit concepts. Ecosystems can be classified based on a single attribute—vegetation, soils, or geomorphology, for example—or they can be classified based on integrated attributes, such as ecological types (Winthers and others 2004), ecological sites (USDA-NRCS 2003), or ecological systems (Comer and others 2003). The taxonomic units of these classifications can be considered biophysical classes. When these classes are mapped in organized, repeating map units, they become biophysical units. These units are land delineations based on the geographic area, physical setting, and vegetation community that can occupy the setting. Physical characteristics include climate, geology, geomorphology, and soils. Vegetation includes the area's native species and associated successional stages—determined according to our best understanding of the historical or natural range of variation, including disturbances. In addition to these attributes, each biophysical setting also features characteristic ecological processes of fire frequency and severity and therefore provides a cogent, robust foundation for determining fire regime and fire regime condition class.

The FRCC analysis completed used the procedures described in the National Interagency Fire Regime Condition Class Guidebook, Version 1.3.0 (<http://www.frcc.gov> June, 2008). For the purposes of this analysis the Sagebrush Steppe Restoration project area landscape used a single biophysical setting (LANDFIRE, 2007); 1) **Inter-Mountain Basins Big Sagebrush Steppe** (BpS #1811250).

The “current” vegetation composition, structure, and pattern was determined using one meter spatial resolution 2013 aerial photography, fuels inventory and monitoring data collected during the summer of 2014, GIS, and additional field work to categorize the landscape into the specified BpS and then further into associated successional classes. Fuels monitoring and inventory data can be found at the BLM USFO. The acreage of each BpS class was calculated from monitoring data collected over the last ten years and fire history records and the percentages were compared

to the reference percentages identified for that BpS. Differences between current and reference was calculated and an FRCC rating was assigned.

Big Sagebrush Steppe (BpS 1811250)

Successional Stage	Reference%	Current%
Class A- Early Development 1	20	83
Class B- Mid Development 1 Open	50	9
Class C- Late Development 1 Closed	30	5
Class D	0	0
Class E	0	0
Uncharacteristic Vegetation	0	3

APPENDIX C – FMDA MITIGATION MEASURES

Fire and Non-fire Vegetation Treatment Restrictions

Vegetation Management

- No chemical treatment would conflict with existing or future national vegetative treatment guidance. To reduce potential resource impacts from chemical treatments, herbicide use would conform to application criteria described in the 1991 document, Environmental Impact Statement for Vegetation Treatment on BLM Lands in Thirteen Western States or in subsequent revisions and/or replacements of this document. Use would conform to instructions from BLM Manual 9011 Chemical Pest Control, as well as label restrictions and current policies and state statutes. In addition, the prescription for herbicide application (desired, optimum environmental conditions) would evaluate off-site migration and non-target species by assessing wind speed and direction, temperature, precipitation forecast, soil infiltration potential, constraints on overland water transport due to precipitation or flooding, establishment of riparian buffer strips, and risk to special status species. Fishery and/or wildlife biologists would assist project planners in selecting appropriate herbicides for use among or near terrestrial and aquatic flora and fauna sensitive to herbicides.
- The economic effects of alternative fuels management practices would be considered. Local involvement and economic benefits from fuels reduction projects would be promoted.
- Vegetation treatment activities would continue to exercise Native American Tribal trust responsibilities.
- Fuels treatments would be utilized to reduce the overall threat of the establishment and spread of noxious/invasive plant species.

Air Quality

- All fire activities on BLM-administered lands would be coordinated with the Montana/Idaho Airshed Group Smoke Management Program. Under this program, Prescribed Fire and WFU could be restricted when regional or local air quality is compromised, or if the project would negatively affect visual quality in Class 1 Airsheds (Yellowstone and Grand Teton National Parks, Bridger Wilderness, Sawtooth Wilderness, and Craters of the Moon Wilderness), Non-attainment Areas, and sensitive receptors.

Cultural Resources and Historic Trails

- The FO will ensure that required and appropriate cultural resource inventories/surveys are completed prior to implementing site-specific fuels projects to meet BLM policy.
- A Class II or Class III inventory will be conducted for all proposed Prescribed Fire areas unless previous inventory has been deemed adequate in consultation with the SHPO and Native American Tribes.
- All prescribed fires and fuels projects will be subject to further site-specific analyses and Section 106 of the National Historic Preservation Act compliance and consultation.
- All proposed fire and non-fire (mechanical, chemical, and seeding) vegetation treatment actions will be assessed in consultation with the SHPO and Native American Tribes for their potential to affect cultural resources. Where previous inventory has been sufficient to identify vulnerable cultural resources, no inventory should be needed. However, where adequate inventory is lacking, appropriate and required inventory of the area as determined in consultation with the SHPO will be conducted.
- Fire project planners should coordinate with the archeologist to incorporate, as necessary, best cultural protection practices in burn plans. Examples of cultural protection practices to be considered may include but are not limited to:
 - Manual reduction of fuels on vulnerable sites/features; disposal of debris away from cultural features.
 - Use of low-intensity backing fire in areas near historic features.
 - Saturation of ground/grass adjacent to vulnerable structures with water, foam, or gel before burning.
 - Pre-burning of site(s) at lower intensity than planned for surrounding areas.
 - Limiting fire intensity and duration over vulnerable sites.
 - Use of a fast-moving, higher intensity fire over lithic scatters, where rock materials are vulnerable to longer-duration heating.
 - Creation of fire breaks near or around sites.
 - Wrapping of structures in fire-proof materials or use of retardant/foam to protect structures.
 - Flush-cutting and covering of stumps with dirt, foam, or retardant where subsurface cultural resources could be affected.
 - Identification of and reduction of hazard trees next to structures.
 - Covering of rock art or wrapping of carved trees, dendroglyphs, and other such features in fire retardant fabric.
 - Limbing of carved trees to reduce ladder fuels.
 - Reduction of fuels and smoke near rock art.
 - Covering of fuels near rock art with foam, water, or retardant, avoiding the rock art.

Placeholder Species

- Plant materials used in re-vegetation actions would be native when appropriate and practical. However, desirable non-native species may be used in re-vegetation actions on harsh or degraded sites, when native seed is not available, or where they would structurally mimic the natural plant community and prevent soil loss and invasion by exotic annual grasses and noxious weeds. The species used would be those that have the highest probability of establishment on these sites. These "placeholders" would maintain the area for potential future native restoration. Native seed would be used more frequently and at larger scales as species adapted to local areas become more available.

Recreation

- Treatments in developed or high-use recreation areas would be designed to minimize impacts to the recreational resource or users.

Wildlife

- Seasonal guidelines may be applied if needed to mitigate the impacts to big game species from planned fuels management and vegetation treatments as specified in the LUPs.
- Restrictions may be imposed on fuels management and vegetation treatment projects in areas supporting nesting raptors as per amended LUPs. Treatment proposals would be coordinated with IDFG.
- Species with recovery plans, conservation agreements, Partners in Flight species, and Birds of Conservation Concern will be protected as specified in their respective plans/agreements.
- Habitat Conservation Assessment and Conservation Strategies have been prepared and are currently being implemented for the following BLM sensitive species: northern goshawk, Columbian sharp-tailed grouse, greater sage grouse, and mountain quail. Vegetation treatments proposed in areas supporting sage grouse and sharp-tailed grouse would be coordinated with IDFG and would be implemented under LUP guidance or restrictions. Project activities in sagebrush would be avoided from March 1st to May 31st to avoid disrupting sage-grouse during the breeding season.
- Seasonal guidelines may be applied to mitigate the impacts to big game species from planned vegetation treatments as specified in LUPs.
- Nest surveys for avian species including sharptailed grouse, sage-grouse and various passerine species would be conducted prior to treatment.
- BMPs for ground nesting birds would be incorporated for treatments near nesting areas; thinning and burning would be avoided between May 7 and July 15.